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CÓDIGO DO DOCUMENTO *7601K1159001 - 022*	
DOCUMENTO	

OBJETO: DISP NOTAS TR + SHUTTER WINCOR

PROJETO: ATM Banco do Brasil	PART NUMBER: CONFORME O SISTEMA OCO650.

		FABRICANTE: *Wincor*	
00	*LIBERAÇÃO INICIAL*	*Leandro*	*26/06/07*
N°	REVISÃO	APROVAÇÃO	DATA

WINCOR NIXDORF

Self-Service Systems

Cash Media Dispenser

Version 4

Service Manual

Do you have ...

... any questions or suggestions
regarding this manual?

Please contact the following address
giving the order number of this manual
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Cash Media Dispenser Version 4

Service Manual

Edition November 2004

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Introduction

This service manual has been compiled for authorized service personnel only. The operating manual, the installation instructions and the service manual of the basic device should also be read since certain details are only described in these instructions.

Symbols used in this manual

– Text following a dash represents an item in a list.

" " Text in quotation marks refers to other chapters or sections in this document.

- Text following this symbol describes actions to be performed in the specified order.

Text following this symbol should be given special attention in order to avoid damage and injury.

Text following this symbol contains general information to facilitate use of the device and help avoid operating errors.

Important safety precautions

Please read the following notes carefully before doing any work on the device.

This device complies with the relevant safety regulations for information processing equipment and is designed for use in a regular office environment.

- When moving the device from a cold to a warm environment, do not operate it for at least two hours to prevent possible damage caused by condensation.
- Only use the original packaging material to transport the device.
- The device is equipped with a safety-tested power cable, which must be connected only to a suitable grounded outlet.
- Always hold the plug when removing the power cable. Never pull the cable itself.
- Install all cables in such a way that they will not be stepped on or tripped over or damaged and crushed in any other way.
- Have damaged power cables replaced immediately.
- Make sure that there is always free access to the sockets used or to the electrical circuit-breakers of the house installation.
- In case of an emergency (e. g. damaged cabinets, controls or power cables, liquids or foreign objects in the device) observe the following instructions:

Deactivate the device immediately by:

Switching off the automatic circuit-breaker or removing the fuse inset from the fuse holder in the distribution box of the building installation;

Disconnecting the plug connector of the power supply cable from the grounded socket in the building installation;

Switching the power switch on the power distributor to OFF (refer to the operating manual of the basic device);

Disconnecting power between the UPS (uninterruptible power supply) and the device (refer to the operating manual of the basic device).

- During a thunderstorm, data transmission lines may not be connected or disconnected.
- Only use accessories and extension components which have been approved by us. Nonobservance can result in damage to the system or violations of regulations concerning safety, radio interference and ergonomical requirements.
- Note that there are only safety extra-low voltage circuits (SELV circuits) if you want to feed voltage from an external source into prepared cables to install additional electronics (e.g. connection for an intruder alarm system).
- Only use cleaning agents approved by Wincor Nixdorf International GmbH for cleaning and maintenance (see chapter "Maintenance and Service").

Repair work

Repair work may only be carried out by authorized personnel.

Unauthorized opening of the device or repair work carried out improperly could result in considerable danger to the user.

In case of noncompliance, Wincor Nixdorf International GmbH excludes all liability.

Lithium batteries

There is danger of fire or explosion if the batteries are handled incorrectly. It is therefore important to note the following points:

- Avoid short circuits.
- Never recharge the battery.
- Avoid temperatures above 100 °C.
- Do not try to open the battery by force.
- Do not allow the battery to come into contact with water or fire.

Replace the battery only with the same or an equivalent type recommended by Wincor Nixdorf International GmbH.

Dispose of used batteries in compliance with national regulations and the manufacturer's specifications.

General power interrupt

A general power interrupt has the following effects:

- All currently running transactions are immediately aborted.
- Dispensed banknotes remain in the transport path of the cash media dispenser. They will be transported to the reject/retract cassette of the CMD-V4 or they remain in the collecting position of the clamp after the device has been turned on again.

Description of the device

Function and use

The most important components in an automated teller machine is the Cash Media Dispenser (CMD-V4).

The CMD-V4 replaces the AZM-NG. The CMD-V4 and the AZM-NG are software-compatible but not hardware-compatible.

CMD cassettes are basically upward- and downward-compatible with some restrictions. They are about 5 mm longer so they cannot simply be deployed in the ProCash BBA mini 3K (up to February 2003) and the ProCash BBA UT with a CEN safe. The ProCash BBA mini 3K requires a technical modification for CMD cassettes to be installed. The old cassettes have to be used in the ProCash BBA UT with a CEN safe.

This manual describes the Cash Media Dispenser, version 4.

Here are some of the characteristics of the Cash Media Dispenser:

- High functional reliability (low reject rate, detection of dispenses of two notes)
- Convenient to use and maintain:
  Electronic and mechanical adjustments have been minimized
  Maintenance intervals: Every two years or after 200,000 transactions
- All known requirements for ecological reuse and disposal have been satisfied.

The CMD-V4 can be tailored to the user's specific requirements thanks to model variants (frontload/rearload) and a variable number of dispensing units in the various housings. The CMD-V4 can consist of the following components, depending on the configuration:

- Stacker transport facility with or without single reject
- Horizontal/vertical output transport facility Rearload/Frontload
- 1-cassette housing with single dispensing unit
- 4-cassette housing with one double dispensing unit or two double dispensing units
- CMD controller
- Cash-out cassette and reject / retract cassette

i The single reject function is only available in devices which are delivered to countries outside the European Union.

Structure of the manual

Outline

The chapter "Introduction" describes the important safety precautions. It also gives an overview of the Cash Media Dispenser Version 4 (CMD-V4).

The features of the CMD-V4 are also described in the chapter "Introduction" in the section "Technical data".

In the chapter "Function and Integration" you will find a description of the individual components of the cash media dispenser.

The "Device Overview and Operation" chapter describes, among other things, how to change the cash-out and reject/retract cassettes, replenish the cash-out cassette and set the banknote size.

The "Start-up" chapter explains how the CMD-V4 is initialized.

The "Troubleshooting" chapter lists the status messages that may be output, together with explanations and action to be taken.

The next chapter "Removal/Installation of Components" provides detailed information on how to replace the components.

The chapter "Maintenance and Service" contains information on maintenance work to be carried out regularly.

The assignment of connector pins is described in the "Pin Assignments" chapter.

Finally, components that can be replaced in the Cash Media Dispenser are listed in the "Spare Parts" chapter.

Supplementary documentation

For the operation and installation of the basic devices, separate manuals are available in several languages which also include a short description of the CMD-V4.

These manuals can be ordered from our print partner. They are also available in the intranet.

Usually the manufacturers' original manuals for OEM components are included in the shipment. They may contain more detailed information.

Manual release

Since production began, some components have been replaced for various reasons (e. g. progress in technology, cost reduction).

Often the hardware replacement does not result in a changed construction of the device (mechanical or electrical) or the functional integration.

In this case, the new component is added to the service manual and the previous component remains in the respective chapter.

If the integration of a new component results in changes, the corresponding chapters will be adapted (e. g. removal/installation, preventive maintenance, etc.).

Technical data

Cash media dispenser without output transport

Power supply:	5.5 A operation 11 A peak (approx. 20 ms)
Dimensions:	The overall dimensions depend on the actual configuration of the CMD-V4.
Height	
Four cassettes:	758.0 mm
Five cassettes:	895.5 mm
Six cassettes:	1033.0 mm
Width:	340.0 mm
Depth with cassettes in place:	537.0 mm
Device weight without cassettes and without single reject:	max. 30 kg
Note sizes in mm:	54 x 85 x 0.08 to 92 x 182 x 0.12
Maximum number of notes per transaction:	60
Dispensing and transport rate:	6 - 8 banknotes / sec.
Number of dispensing units:	2 to 6
Security functions implemented:	Data Encryption Standard (DES) for line encryption

Stacker

Dimensions

Depth:	505	mm
Width:	301	mm
Height:	208	mm

Weight

with single reject:	8.820	kg
without single reject:	8.500	kg

Output transport

Vertical output transport Frontload in ProCash 2000xe and ProCash 2100xe

Dimensions

Depth:	400	mm
Width:	200	mm
Height:	230	mm

Weight: 1.5 kg

Vertical output transport Rearload in ProCash 2000xe and ProCash 2100xe

Dimensions

Depth:	400	mm
Width:	200	mm
Height:	230	mm

Weight: 1.5 kg

Horizontal output transport Frontload 101 mm in ProCash 1500xe

Dimensions

Depth:	130	mm
Width:	200	mm
Height:	50	mm

Weight: 1.0 kg

Horizontal output transport Frontload 125 mm in ProCash 5000 mini and ProCash 5000

Dimensions

Depth:	130	mm
Width:	250	mm
Height:	70	mm

Weight: 0.5 kg

Horizontal output transport Frontload 241 mm in ProCash 2350xe

Dimensions

Depth:	250	mm
Width:	200	mm
Height:	50	mm

Weight: 1.0 kg

Horizontal output transport Rearload 124 mm in ProCash 1500xe

Dimensions

Depth:	130	mm
Width:	200	mm
Height:	50	mm

Weight: 1.0 kg

Horizontal output transport Rearload 232 mm in ProCash 2050xe, ProCash 2150xe and ProCash 2250xe

Dimensions		
Depth:	345	mm
Width:	227	mm
Height:	57	mm
Weight:	0.52	kg

Shutter

Dimensions	Shutter vertical Rearload and vertical Frontload	
Depth:	310	mm
Width:	150	mm
Height:	100	mm
Weight:	0.5	kg

Dimensions	Shutter horizontal Rearload	
Depth:	305	mm
Width:	126	mm
Height:	67	mm
Weight:	0.9	kg

Dimensions	Shutter horizontal Frontload	
Depth:	310	mm
Width:	150	mm
Height:	100	mm
Weight:	0.9	kg

CMD controller

Processor:	80C188XL 20 MHz
Memory:	512 Kbyte static RAM
	512 Kbyte Flash-PROM (PUT, bootloader)
Interface:	USB 1.1 Full-Speed
	V.24 (RS232)
Transmission parameters	
Line speed:	19.2 / 56 Kbaud
	automatic baud rate recognition
Data format:	NRZ
Parity:	ODD
Code width:	8 Bit + Parity
Stop bits:	2
Dimensions	
Depth:	430 mm
Width:	160 mm
Height:	25 mm
Weight:	0.42 kg

4-cassette housing (without contents)

Dimensions		
Depth:	450	mm
Width:	305	mm
Height:	600	mm
Weight:	10.9	kg

1-cassette housing (without contents)

Dimensions		
Depth:	450	mm
Width:	305	mm
Height:	162	mm
Weight:	3.34	kg

Double dispensing unit without DDU

Dimensions		
Depth:	282	mm
Width:	305	mm
Height:	200	mm
Weight:	3.30	kg

Double dispensing unit with DDU

Dimensions

Depth:	282	mm
Width:	305	mm
Height:	200	mm

Weight: 3.34 kg

Single dispensing unit without DDU

Dimensions

Depth:	144	mm
Width:	310	mm
Height:	141	mm

Weight: 1.76 kg

Single dispensing unit with DDU

Dimensions

Depth:	144	mm
Width:	310	mm
Height:	141	mm

Weight: 1.80 kg

Reject / retract cassettes

Capacity

Reject compartment:	max. 400 notes
Retract compartment:	max. 100 notes

Dimensions

Depth:	260 mm
Width:	253 mm
Height:	118 mm

Weight: 1.5 kg

Reject cassettes

Capacity

Reject compartment:	max. 400 notes

Dimensions

Depth:	260 mm
Width:	253 mm
Height:	118 mm

Weight: 1.3 kg

Cash-out cassettes

Banknote dimensions

Size:	54 x 85 mm to 92 x 182 mm
Thickness:	0.08 mm to 0.12 mm

Filling capacity: Banknote bundles up to 310 mm thick

Dimensions

Depth:	441	mm
Width:	264	mm
Height:	125	mm

Weight: 3.5 kg

Environmental conditions

Climatic environmental conditions in accordance with EN 60721

	Class	**Ambient temperature °C**	**Relative humidity % r.h.**
Operation	3K3	+ 5 to + 55 *	5 to 85
Transport	2K2	- 25 to + 70 (12 hours flying time)	10 to 95 (12 hours flying time)
Storage	1K2	+ 5 to + 40 (max. 30 days)	10 to 85

* The temperature value of + 55 °C deviates from the value of the standard (+ 32 °C).

Mechanical environmental conditions in accordance with EN 60721

	Class	**Comment**
Operation	3M2	Building with minimum external vibration.
Transport (in original packing)	2M2	All types of commercial vehicles and trailers as well as rail and air transport
Storage	1M3	Noticeable vibration and shocks, e.g.

(in original packing) by machines or passing vehicles.

Noise emission in accordance with EN 27779

Noise values acc. to ISO 9296	**Idle mode**	**Operation***
Sound power level L_{WAd}	6.1 B	6.9 B
Workplace-related sound pressure level L_{pAm} (at adjacent workplace)	44 dB	50 dB

* typical operating cycle

Compliance with standards and certifications

Standards met

Safety standards:	EN 60950 CSA C22.2-60950 UL 1950 UL 60950
EMC standards:	EN 55022 class B FCC CFR 47, part 15, subpart B, class A EN 55024

Conformity

The CE mark of conformity attached to the product or its package indicates that the product complies with the requirements of the following EC directives:

- EMC Directive 89/336/EEC including the amending directive 93/68/EEC
- Low Voltage Directive 73/23/EEC including the amending directive - 93/68/EEC

The corresponding statement of compliance has been issued by

Wincor Nixdorf International GmbH
Heinz-Nixdorf-Ring 1
33106 Paderborn

FCC rules and Canadian standard ICES – 003

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Canadian Standard ICES - 003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operating in a commercial environment. The equipment generates, uses and can radiate high frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notes concerning radio interference suppression and electrical safety

All other devices connected to this product must comply with the EMC Directive 89/336/EEC including the amending directive 93/68/EEC and the Low Voltage Directive 73/23/EEC including the amending directive 93/68/EEC.

Environmental protection

Environmentally friendly product design and development

This product has been designed according to our corporate standard 'Environmentally friendly product design and development'.

This means that crucial criteria such as long life, choice of material and its labeling, emissions, packaging, ease of disassembly and recyclability have been taken into account.

This saves resources and relieves the strain on the environment.

Saving energy

Please switch on devices that need not be constantly running only when they are actually needed. They should also be turned off when they are not need for longer periods of time.

Disposing of used consumables

Please dispose of printer consumables, batteries, fluorescent tubes as well as cleaning and maintenance material according to the applicable regulations of your country (observe manufacturer's specifications).

Labels on plastic case parts

Please do not stick any labels on plastic case parts since that would make recycling more difficult.

Returning, recycling and disposing of used units and consumables

Details regarding the return and recycling of used units and consumables can be obtained from your local branch office or from our Recycling Center in Paderborn:

Tel.: **+49 (0) 52 51 8-1 80 10**
Fax.: **+49 (0) 52 51 8-1 80 15**

Further information

can be obtained from our Environmental Protection section (Referat Umweltschutz):

Tel.: **+49 (0) 52 51 693-67 07**
Fax.: **+49 (0) 52 51 693-67 09**
Email: **mailto:referat.umweltschutz@wincor-nixdorf.com**

Abbreviations

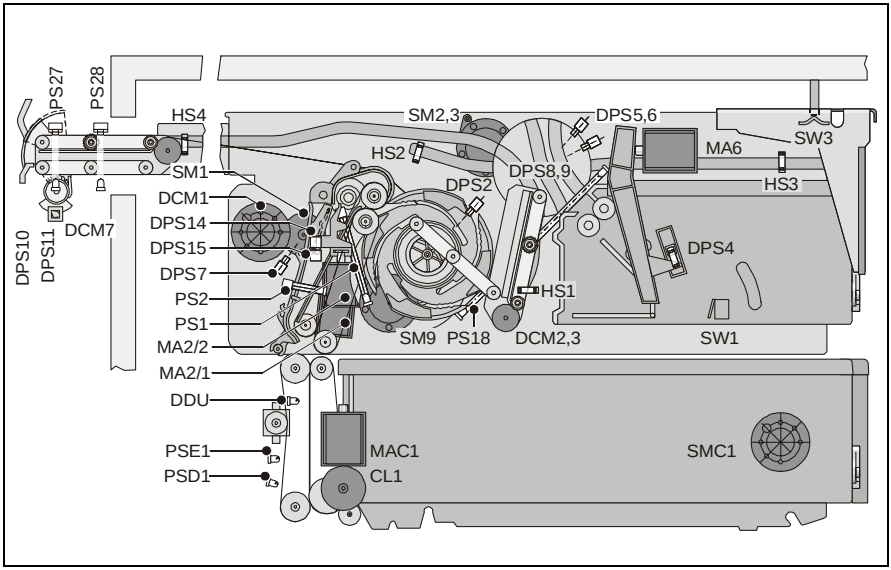
ASCII	American standard code for information interchange
CE	Communauté Européenne (European Community) Declaration of Conformity
CEN	Comité Européen de Normalisation (European committee for standardization)
CL	Clutch
CMD	Cash media dispenser
CMOS	Complementary metal oxide semiconductor
CPU	Central processing unit
DCM	Direct current motor
DDU	Double detection unit
DES	Data encryption standard
DIN	German Institute for Standardization
DMA	Direct memory access
DPS	Digital photosensor
DSP	Diagnostic and service package
EEPROM	Electrical erasable programmable read only memory
EC	European Community
EEC	European Community
EMC	Electromagnetic compatibility
EN	European standard
EPROM	Erasable Programmable Read Only Memory
FCC	Federal Communications Commission
FD	Floppy disk
FRU	Field repair unit
HR	Retaining magnet
HS	Hall sensor
ISO	International Organization for Standardization
KDIAG	Components diagnostics
LED	Light-emitting diode
MA	Magnet
MAC	Magnet cassette
OEM	Original Equipment Manufacturer

PC	Personal computer
PLD	Programmable logic device
PROM	Programmable read only memory
PS	Photosensor
PSD	Photosensor Dispense (dispensing sensor)
PSE	Photosensor Empty (cassette empty)
RAM	Random access memory
RL	Rearload
S	Switch
SAT	Stacker and output transport
SCOP	Security cash out procedure
SM	Stepper motor
SMC	Connector Motor Cassette
ST	Connector
SW	Software
T	Timing disk
UL	Underwriters Laboratories Inc.

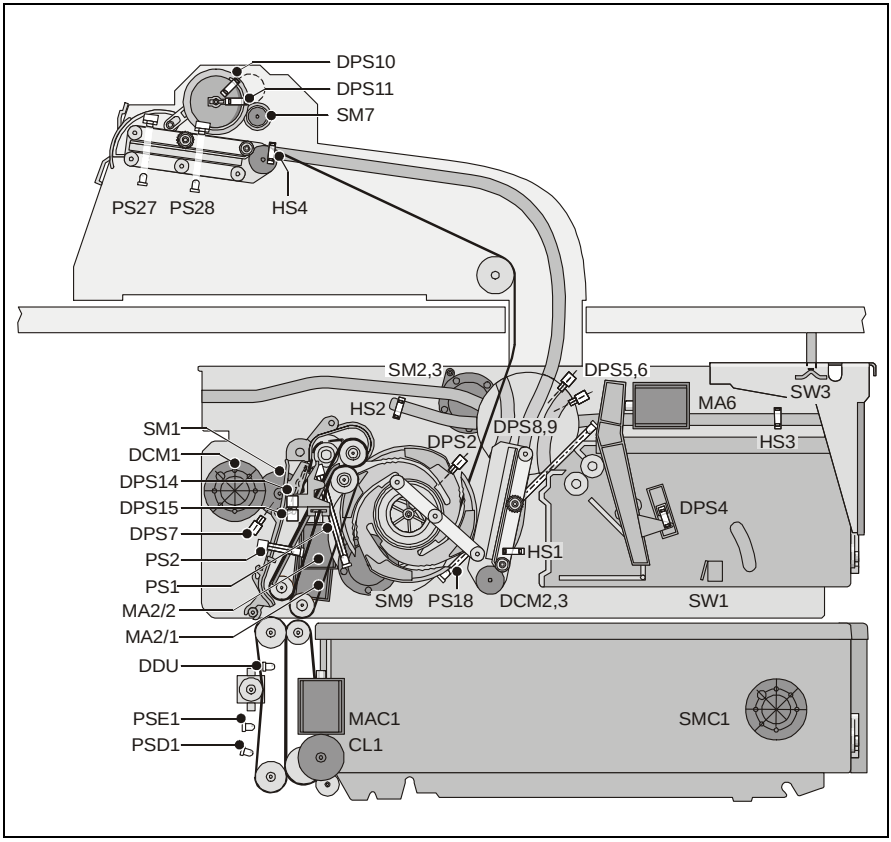
Function and Integration

Sensors and electromechanical components

Horizontal output transport



Vertical output transport



Stacker and output transport

Compo-nent	Name	Location
D	Permanent magnets (3 units) – without sensors	Clamp
DPS 2	Stacker wheel position query	Stacker wheel input
DPS 4	Sensor: position of retract compartment	Reject / retract box
DPS 5	Sensor: home position	Routing disk drive, left
DPS 6	Sensor: home position	Routing disk drive, right
DPS 7	Home position of sliding surface	Single reject
DPS 8	Sensor: Position	Routing disk drive, left
DPS 9	Sensor: Position	Routing disk drive, right
DPS 10	Digital photosensor (hybrid photosensor)	Shutter
DPS 11	Digital photosensor (hybrid photosensor)	Shutter
DPS 14	Home position of switch	Single reject
DPS 15	Switch position: single reject	Single reject
HS 1	(Hall sensor) Home position	Clamp positioning
HS 2	(Hall sensor) RR home position (behind the routing disk)	Clamp positioning
HS 3	(Hall sensor) Reversal in Frontload direction (if required)	Clamp positioning
HS 4	(Hall sensor) 'Stop over' position and final position of clamp	Clamp positioning
PS 1	Stacker wheel input	Stacker wheel input
PS 2	'Tray empty' check	Single reject
PS 18	Tray monitoring/ input monitoring 'clamp empty'	Swivel drive for clamp flap reject/retract box
PS 27	Removal photosensor	Clamp positioning
PS 28	Bundle rear edge control	Clamp positioning
DCM 1	Main drive motor	Stacker wheel input
DCM 2	Traction motor + planetary gears	Clamp
DCM 3	Belt drive + planetary gears	Clamp
DCM 7	DC motor (outdoor)	Shutter
MA 2/1	Switch control magnet	Single reject
MA 2/2	Switch control magnet	Single reject
MA 6	Magnet for retract comportment	Reject box

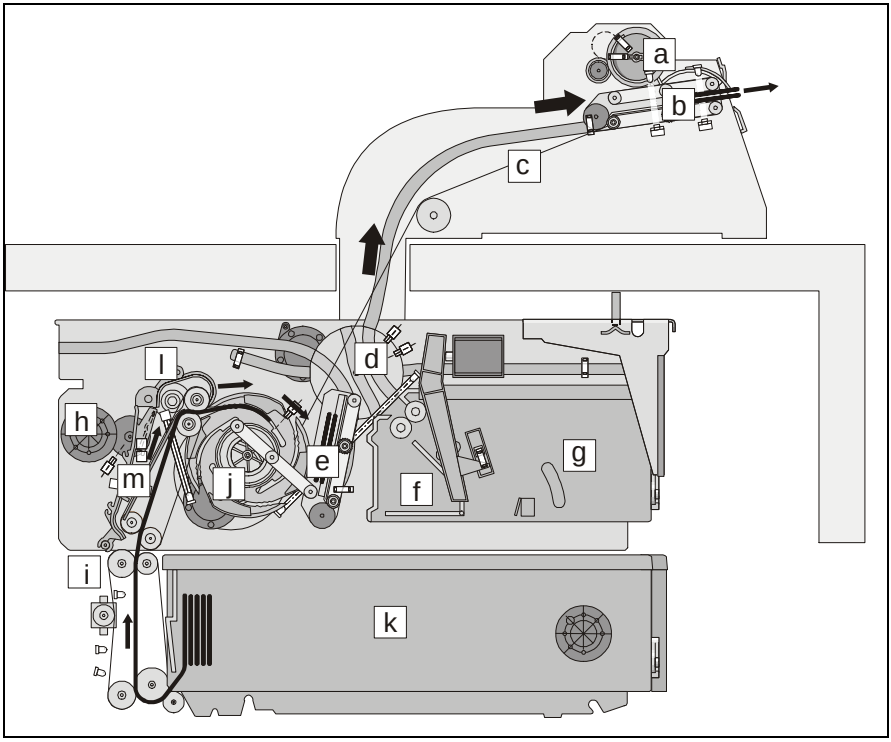
Compo-nent	Name	Location
SW 1	Reject / retract box pushed in	Reject box
SW 3	Locking switch	Release lever
SM 1	Pressure on sliding surface for emptying	Single reject
SM 2	Routing disk motor	Routing disk drive, left
SM 3	Routing disk motor	Routing disk drive, right
SM 7	Stepper motor (indoor)	Shutter
SM 9	Stacker wheel stepper motor	Stacker wheel input
T 1	Timing disk	at main motor DCM1

Components of dispensing unit and cassette

Component	Name	Location
MACx	Retaining magnet	Dispensing unit; cassette x (x = 1 – 6)
CLx	Extractor gear	Dispensing unit; cassette x (x = 1 – 6)
PSDx	Dispensing sensor	Dispensing unit; cassette x (x = 1 – 6)
PSEx	Empty sensor	Dispensing unit; cassette x (x = 1 – 6)
DDU	Length measurement, measuring station	on the upper dispensing unit
SMCx	Stepper motor for pressure	in cassette x (x = 1 – 6)
STx	Cassette connector	at cassette x (x = 1 – 6)

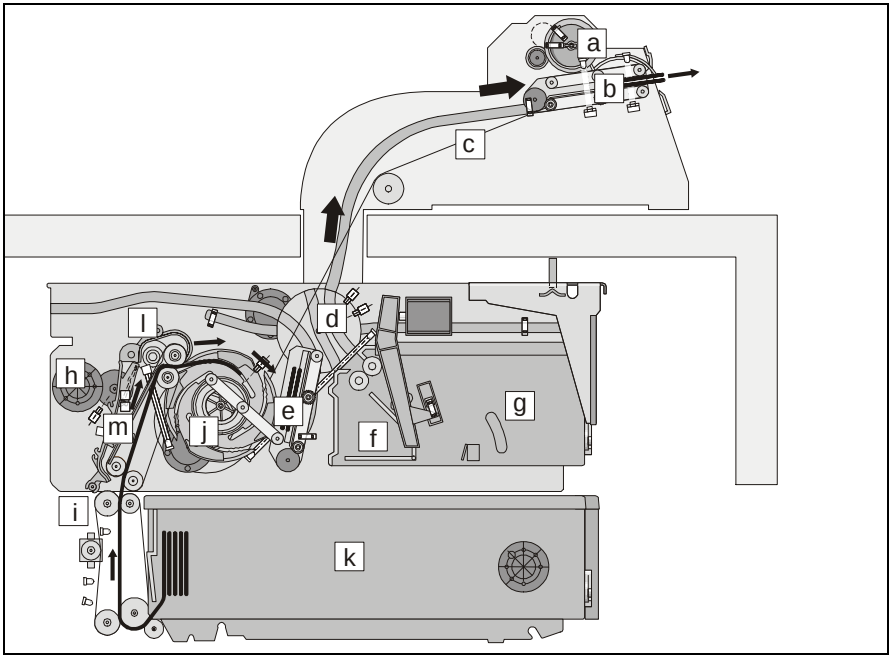
Procedures in the CMD-V4 (schematic)

The following sections show and describe the most important procedures in the CMD-V4 step by step on the basis of this schematic drawing of the CMD-V4 with a vertical output transport (frontload).



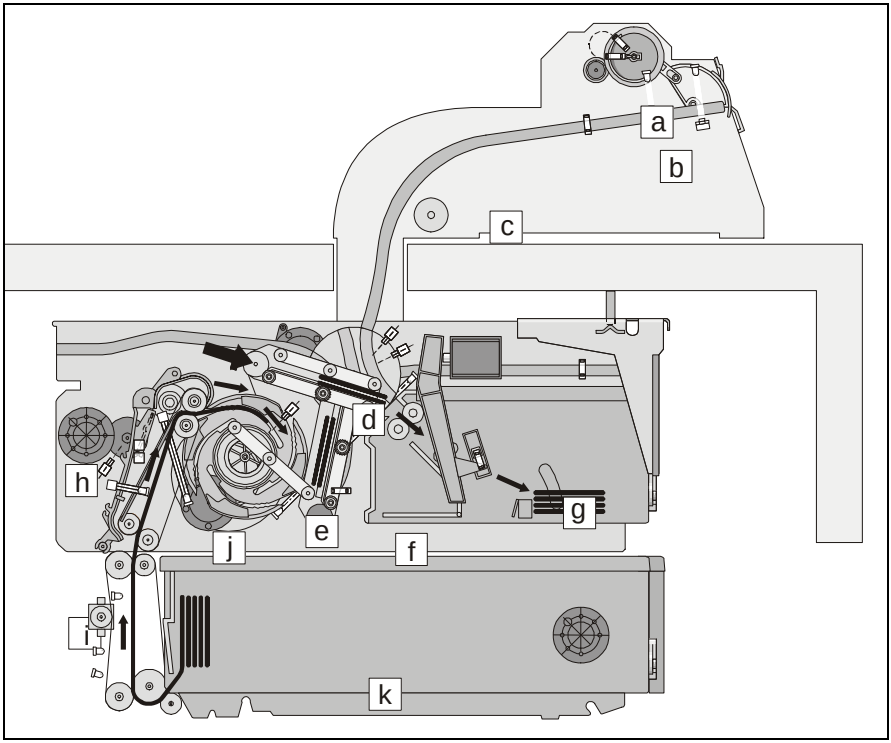
1 Shutter
b Clamp in home position
c Vertical output transport FL
d Routing disk
e Clamp in stacking position
f Retract compartment of reject / retract cassette
g Reject compartment of reject/retract cassette
h Main drive motor
i Thickness measuring station
j Stacker wheel
k Cassette 1
l Single reject switch
m Single reject compartment

Dispensing in customer direction (vertical, frontload)



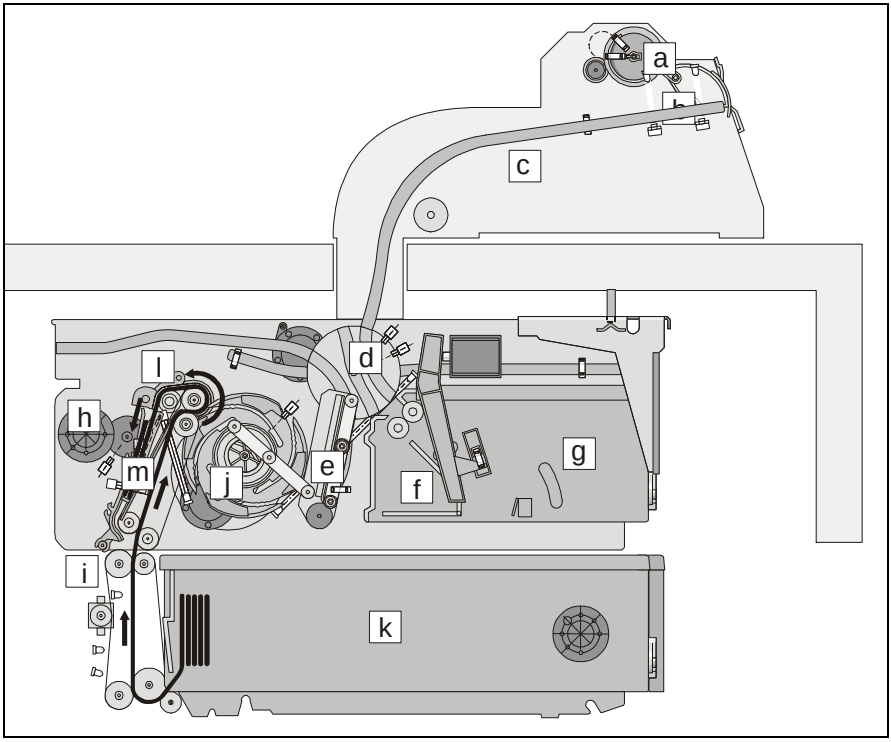
1. The required number of notes are dispensed successively from each cassette (total of max. 60) (k)
2. The individual notes are moved to the thickness measuring station (i)
3. All good notes are placed in the stacking position of the clamp (e)
4. The clamp is closed with the aid of the routing disk.
5. The routing disk moves to the output position (d).
6. The bundle of notes is transported to the output position (b).
7. The shutter opens.
8. The bundle of notes is transported to the removal position.
9. The customer removes the bundle of notes.
10. The shutter closes.
11. The clamp moves back to the stacking position and automatically opens (e).

Bundle reject



1. - 4. The procedure is the same as for dispensing in customer direction (vertical, frontload).
5. The routing disk moves to the reject/retract position (d).
6. The bundle of notes is transported to the reject compartment of the reject / retract cassette (g).

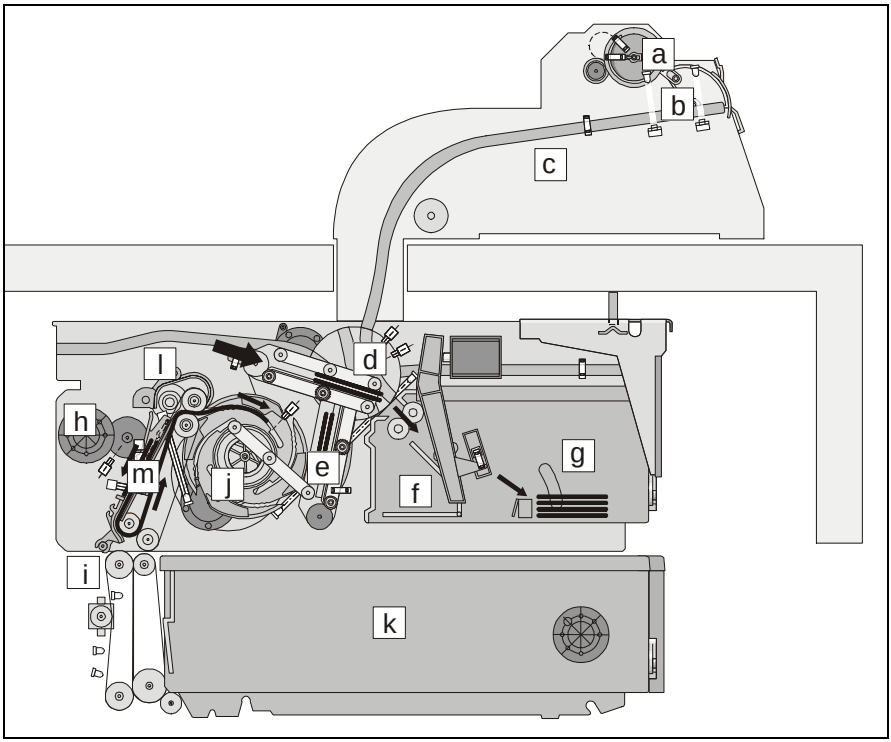
Single reject



1. - 3. The procedure is the same as for dispensing in customer direction (vertical, frontload).

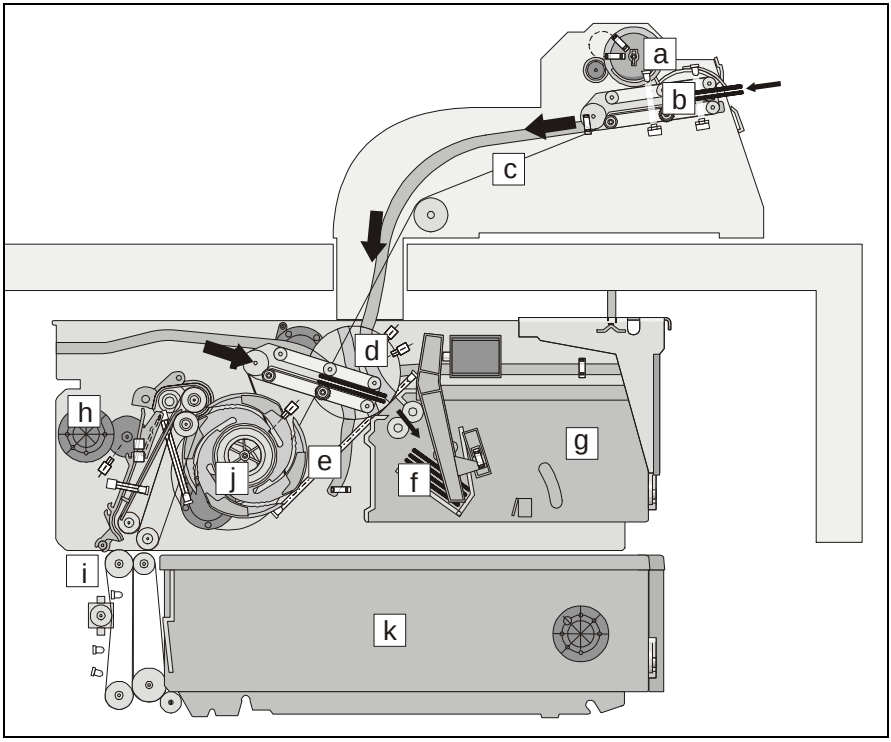
3.1 If a bad note is detected it is rejected via the single reject switch (l) and placed in the single reject compartment (m). Up to two bad notes can be placed in the single reject compartment. They do not have to originate from one transaction.

4. - 11. The procedure is the same as for dispensing in customer direction (vertical, frontload).



12. Bad notes are taken from the single reject compartment (m) via the stacker wheel (j) and placed in the stacking position of the clamp (e).
13. The routing disk moves to the reject/retract position (d).
14. The notes are transported to the reject compartment of the reject/retract cassette (g).

Bundle retract when notes are not removed



1. - 8. The procedure is the same as for dispensing in customer direction (vertical, frontload).
9. The notes are not removed within the defined time!
10. The notes are retracted to the output position (b).
11. The shutter closes.
12. The clamp moves toward the stacker unit (c).
13. There is a reject/retract compartment switchover.
14. The bundle of notes is transported to the retract compartment of the reject / retract cassette (f).
15. The clamp moves back to the stacking position and automatically opens (e).

Procedures in the CMD-V4

Start-up behavior

With a reset or after power-up it is checked whether the CMD-V4 is ready to operate. This is only the case if the command is executed without errors!

After device reset, the CMD-V4 is in a defined status.

Execution of the command is cancelled when the first error is detected. The causes of errors can be seen on the controller's status display (see the "Troubleshooting" chapter).

Controller test

A reset uses the same routine as power-up in principle but the controller test is not performed. The controller test takes about six seconds and is finished when <--> appears on the status display. In the event of an error, processing is aborted with status code <10> (controller defective).

Firmware test

The validity of the loaded firmware is checked. Processing may be aborted with status code <11> (firmware missing).

Memory reset

The internal markers are reset.

In addition to the general memory area, there are program and parameter areas the contents of which are retained by means of a support battery if a power failure occurs.

Determination of the device type

The device type is determined automatically via the components that are connected to the controller board (number of dispensing units, shutter present (yes/no), output direction).

Checking the cassettes

First of all, the type and quantity of cassettes which are physically available is determined. The values from the cassette memory are compared with the internal data. If they do not match, the cassettes in question are flagged as 'new'.

To operate correctly, at least one operable cash-out cassette and also the reject/retract cassette are necessary. If this minimum requirement is not satisfied, this is indicated on the status display with error code <14>. The device is not ready for operation.

Checking the photosensors

All photosensors are checked. The result is processed internally.

The following status indications/alerts can occur in the event of an error:

<70 ... 9A> photosensors dirty.

Checking the device locks

Processing is aborted if the device lock 'Customer retract without storing bundle of notes' is set (status code <13>) or if the safety switch is open (status code <12>).

Checking mechanical and electronic components

Individual components are checked. The following errors may occur:

<21> Thickness measuring station defective (DDU)
<23> Routing disk defective / blocked (SM 2 / SM 3)
<24> Reject / retract drive defective / blocked (MA 6)
<25> Dispensing drive defective (DCM 1)
<26> Stacker wheel drive defective / blocked (SM 9)

Checking the transport paths

If notes are or were accessible to the customer, the first operation is a retract.

If there is a bundle of notes in the clamp at the time of a reset, a bundle reject takes place.

When the output transport is free, the transport motor is activated for approximately five seconds. All detected banknotes are transported into the reject cassette.

In the event of an error the status display may show the following:

<18> Banknotes jammed during dispensing
<19> Clamp transport defective / blocked

Checking the shutter

If available, the functionality of the shutter is checked by opening and closing the flap. If the test cycle is not performed properly, processing is aborted with error code <28> on the status display.

Dispensing

Checking the basic state

A check is run to determine whether:

- The transport paths are free.
- All required cassette positions are ready for operation and logged on.

The number of notes required via the system interface is dispensed from each cassette. The dispensed notes are transported to the thickness measuring station.

All good notes are placed in the clamp's stacking position. If a bad note is detected during dispensing there is a bundle reject. The dispensing command is repeated.

Dispensing finishes when:

- The number of notes requested is available
- A cassette becomes empty during a dispensing procedure
- The required number of notes cannot be made available within one minute
- It is impossible to dispense notes from one cassette

Double dispense / note sizes out of tolerance

If the measuring station detects double or overlapped notes, this is termed a 'double dispense'. In this case the dispensing operation is interrupted until all notes have arrived in the clamp. Then a bundle reject takes place followed by another dispensing command.

If five double dispenses are detected from one cassette, dispensing is terminated with status code <5x> (too many bad notes from cassette x).

Undefined notes

If more notes arrive in the clamp's stacking position than were dispensed, a bundle reject takes place. The original command is then repeated.

The command is cancelled if three successive attempts result in the status display <3x> (too many bundle rejects from cassette x).

Dispensing of notes not possible

If the CMD-V4 cannot separate a single note, the dispensing process is again initiated.

The attempt to dispense is repeated a maximum of five times. The command is then cancelled by the CMD-V4 with the status display <4x> (dispense from cassette x not possible; cassette empty or notes stuck together).

Banknote jam

A banknote jam may occur during dispensing allowing transportable notes to be moved to the clamp's stacking position.

A banknote is dispensed from the lowest cassette and transported to the clamp's stacking position.

The transport path is clear again when the banknote reaches the clamp's stacking position. A bundle reject takes place. In the case of standard dispensing, the original command is repeated.

The procedure is repeated up to two times if a banknote does not reach the clamp's stacking position. It is then obvious that there is a banknote jam which cannot be eliminated. No further device operation takes place. The status display shows code <18> (banknote jam during dispensing). The device can no longer be operated.

A check is necessary, the jam must be removed manually. A reset must follow removal of the jam.

Transport

The transport functions output notes that have been dispensed or places them in the reject/retract cassette.

The term 'transport' covers the following functions:

- Transport to waiting position
- Bundle reject
- Cash presentation (incl. waiting for removal)
- Cash output
- Retracting and storing banknotes
- Retracting cash without storing it
- Shutter test/open/closed

Transport to waiting position

This command is executed prior to actual banknote output. It is used to transport the bundle of notes from the clamp's stacking position to the waiting position. This position is just in front of the shutter.

Bundle reject

This function is used to transport banknote bundles that had not been accessible to the customer to the reject cassette.

Single reject

This function is only available for shipments to countries outside the European Union.

If a bad note is detected during dispensing, this single note is rejected and another note is dispensed. Up to two notes per transaction can be placed in the single reject compartment. When the transaction has been completed, the notes are transported from the single reject compartment to the reject/retract cassette.

Cash presentation (incl. waiting for removal), cash output

Before cash is actually transported, the shutter, if present, is opened. Then the notes that have been provided in the waiting position are presented to the customer.

The system controls the rest of the handling.

- Cash output
  In this case, the cash is being offered until all photosensors are free.
- Cash presentation
  Banknotes are advanced until the bundle is accessible to the customer. The device then waits for the cash to be removed.

When the notes have been removed, the shutter is closed and the clamp moves back to the stacking position. The function finishes when the shutter has closed completely again and the clamp has reached the stacking position.

If individual notes were parked in the single reject switch, they are transported to the reject compartment of the reject/retract cassette via the clamp.

Retracting and storing banknotes

This function first retracts the bundle of notes into the waiting position. The shutter is closed. Then the bundle of notes is placed in the retract compartment of the reject/retract cassette.

Retracting cash without storing it

Refer to the "Retracting and storing banknotes" section for details of this function.

When the shutter has closed, the clamp moves to the stacking position and opens. The bundle of notes remains in the clamp so that it is possible to associate it with the customer. A device lock is triggered.

If the device lock is set (status display <13>), all dispensing and transport commands are rejected. In addition, the function button cannot be activated in this case.

The flag remains set even in the event of a power failure; it is not reset if the device is reset. When the bundle of notes has been removed, the device lock has to be cancelled in order to be able to continue using the CMD-V4.

Cassette handling

All cassette positions are checked cyclically for changes with the help of the respective pressure sensor.

If a new cassette has been added, the dispensing pressure is built up. An audible signal is output three times if the pressure cannot be built up. Status code <4*x*> is displayed.

Then the data is read from the cassette memory.

The following data is stored in the cassette:

- Cassette ID
  On shipment, this 7-character value contains the serial number of the cassette. It can be set to a customer-specific value by the system.
- Currency code
  This is the 3-character currency code according to ISO 4217 (codes for representation of currencies and funds), for example EUR.
- Issue date
  The banknote issue date contains an additional 4-character indicator (YYMM of the issue). This means that the CMD-V4 can process notes which have the same face value but different note characteristics.
- Denomination
  This value defines the note's denomination (8 characters).

After a cassette exchange, the new cassettes must first be confirmed by the system software. If this does not take place, dispensing jobs for certain cassette positions may be rejected (the status of the cassette stays at 'Newly added').

Status code <14> (minimum configuration missing) is displayed if one cash-out cassette and the reject cassette, at least, are not logged on in the system after an exchange.

CMD controller

The CMD controller features the 80C188 microprocessor and controls communication with the higher-level system unit and the modules connected to the CMD-V4.

Data is transferred between the system unit and the CMD-V4 via an RS232 interface. The transfer parameters are identified automatically.

RS232C-Interface (CMD controller 01750055781)

Data transfer between the system unit and the CMD-V4 can be carried out either via USB or using the RS232C interface, as desired. The transfer parameters for the RS232C interface are established automatically. In exceptional cases you can use jumpers to set up the standard line parameters (19200,8,2,ODD).

The USB interface conforms to USB 1.1 Full Speed.

USB interface (CMD controller 01750074210)

Jobs are no longer transferred with the ISO protocol via USB. In its place, short package mode is used for flow control. The national USB chip that is used supports a maximum FIFO depth of 64 bytes. If more than 64 bytes are to be transferred to or from the CMD_V4, the data is split into 64-byte blocks and sent separately. Any packet that contains less than 64 bytes of data is known as a short package. Only when a short package is received is the receive buffer with the receive data returned to the caller.

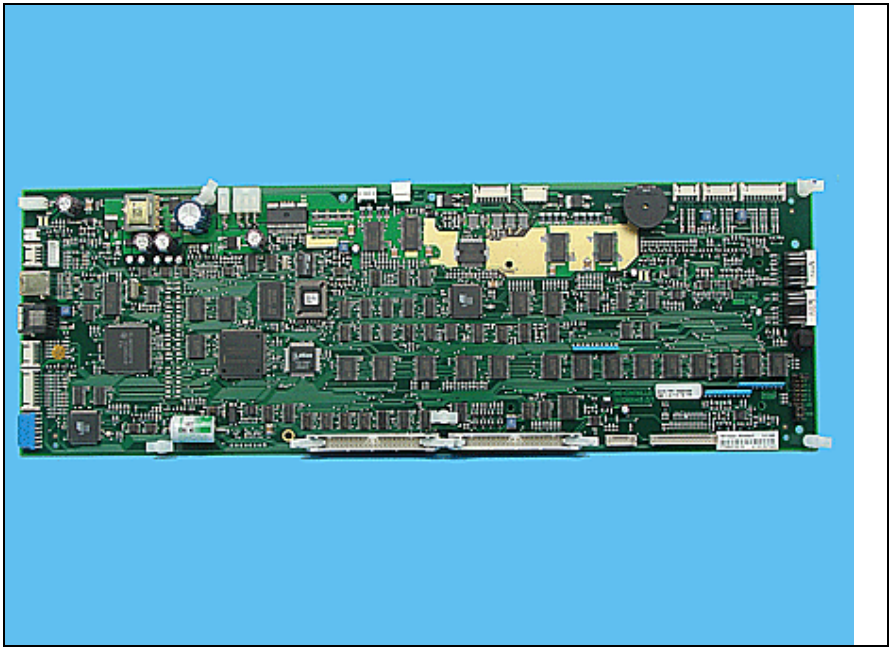
If the USB cable is connected to the CMD_V4 controller and enumeration has been executed with the PC host, commands can subsequently only be sent and received via USB.

After disconnecting the USB cable from the CMD_V4 controller or deactivating the PC host, the system switches back to V.24, i.e. USB has higher priority than V24.

In addition to the normal command channel, there is also a debug channel, which communicates warnings and error messages from the firmware to the PC host. The debug channel is immediately activated during device enumeration (CMD_V4). The PC application can optionally evaluate the debug channel. The debug channel is not a service channel, i.e. it cannot be used to send data to the device.

The controller consists of the following components:

Function group	**Components**
80C188-CPU with 20 MHz	Execution Unit Programmable interrupt controller Counter timer controller DMA unit Chip select unit Bus interface unit
Memory	512 KB static data RAM 512 KB flash PROM (PUT/bootloader)
DUART 16C552	



The figure above shows the component side of the CMD controller with the cover removed. The CMD controller controls all procedures in the CMD-V4 and communication with the higher-level system unit.

The following functions have been integrated in the CMD controller:

- Note measurement
- Photosensor control
- Motor and module control for up to two double dispensing units and two single dispensing units
- Cassette control

Firmware

The loadable firmware CMD_V4_0.bin is stored in a flash-PROM. Externally it behaves compatibly with the AZM-NG.

For updating the firmware via the USB interface you will need a KDIAG equipped for USB. It is, in principle, still possible to perform the update via the serial port (provided the appropriate connectors are available); you will need to unplug the USB connector from the controller before you can do this.

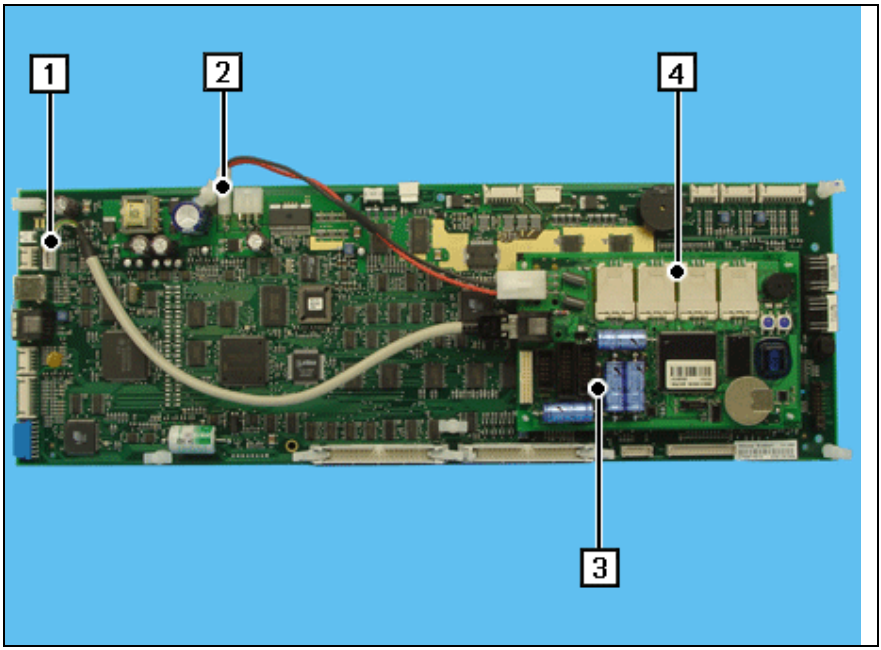
The number of dispensing units is detected automatically via the connected distributor board.

Exception: 4-channel distributor board for the 4-cassette housing with just one dispensing unit. This configuration has to be defined by jumpering.

The CMD controller is split up into the following function blocks:

- Control block
- I/O block with motor control
- Photosensor electronics
- Thickness sensor electronics
- Component control
- Serial interface

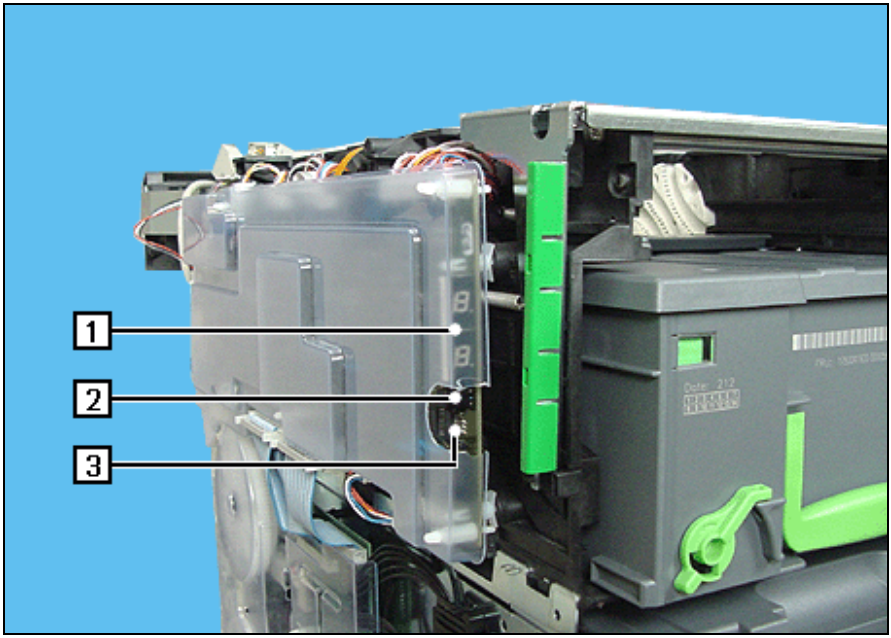
SCOP



1 V.24 interface SCOP card
2 24 V connector for SCOP card
3 SCOP card
4 Slots for chipcards

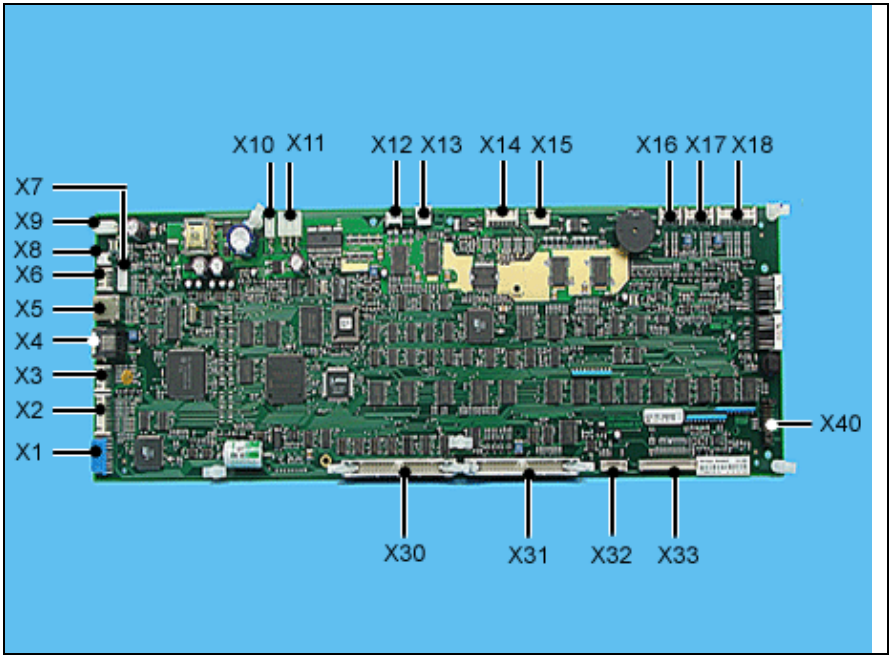
The above illustration shows the component side of the CMD controller with its cover removed and the SCOP card in place.
The SCOP can optionally be connected to the CMD controller. It is used to authenticate the dispensing job. To work, the SCOP has to be connected and must contain a smartcard.

Position of function groups



1 Two 7-segment displays
2 Function button
3 Jumper panel

Connectors on the CMD controller



Connector	Description
X1	Mechanical thickness sensor
X2	Shutter
X3	Transport module
X4	V.24 interface from PC
X5	USB interface from PC
X6	Door switch and safety switch in safe
X7	V.24 interface SCOP card (AVT2800)
X8	Special electronics module
X9	24 V power supply
X10	24 V connection to SCOP card (AVT2800)
X11	Motor M1

Connector	Description
X12	Additional motor attached to the main drive assembly for single reject (optional)
X13	Clamp motors
X14	Motors and lifting magnets on stacker / left and right side panel
X15	EEPROM on stacker
X16	Hall sensors on stacker
X17	Hybrid photosensors on single reject
X18	Hybrid photosensors on stacker / left side panel
X30	Dispensing unit
X31	Dispensing unit
X32	Hybrid photosensors and photosensors on stacker / right side panel
X33	Position switch and extensions
X40	Jumpers

The pin assignments are described in the "Pin Assignments" chapter.

Logical interface

All commands from the host system to the CMD-V4 and responses from the CMD-V4 to the host system follow the master/slave principle. This means that the CMD-V4 does not send any spontaneous messages.

Usually, a command is fully executed by the CMD-V4 and then acknowledged. If further commands are transmitted during this time, the CMD-V4 rejects them.

Command from host system

Length	Contents	Meaning	
1	D	Device identifier (dispenser)	(ASCII)
1	a	Command specification	(ASCII)
1	a	Additional specification for command	(ASCII)
n	XX ... XX	Any data	(ASCII / HEXA)

Acknowledgement by the CMD-V4

Length	Contents	Meaning	
1	D	Device identifier (dispenser)	(ASCII)
1	a	Command specification	(ASCII)
1	a	Additional specification for command	(ASCII)
1	a	Status code	(ASCII)
n	XX ... XX	Any data	(ASCII / HEXA)

Overview of commands

Command	Description
Dablank	RESET
DAB	Clearing
DBA	Pre-Dispense
DBC	Added dispense
DBS	Dispensing: Standard
DCA	Transport: Waiting for cash removal
DCB	Transport: Bundle reject
DCC	Transport: Close shutter
DCE	Transport: Output notes
DCO	Transport: Open shutter
DCP	Transport: Present cash
DCQ	Transport: Cash retract without storage
DCR	Transport: Cash retract with storage
DCT	Transport: Shutter test
DCW	Transport: Target = stop over
DDblank	Cancel
DEC	Component status
DED	Device status
DEF	Properties
DEK	Read firmware configuration
DES	Read SCOP status
DFA	Confirm number of banknotes
DFB	Confirm number of banknotes (without error)
DFC	Confirm existing cassettes
DFD	Note parameters II
DFG	Write firmware configuration
DFI	Cassette ID (standard)
DFL	Set minimum quantity

Command	Description
DFN	Number of banknotes
DFO	Number of banknotes (without check)
DFP	Note parameters I
DFQ	Reset lock flag without error
DFR	Reset lock flag
DFT	Delete retract counter
DFX	Write value in cassette
DFY	Write value from cassette
DFZ	Power on – reset without PUT
DGblank	Reference value determination
DHC	Code test
DHI	Request initial value
DHL	Load line code
DHO	Switch encryption off
DHT	Load transport code
DHZ	Transparent smartcard access
DIC	Software transfer: Activate booter
DID	Software transfer: Data
DIH	Software transfer: Firmware hash
DIL	Software transfer: Read firmware ID
DIR	Software transfer: Read EEPROM (booter)
DIW	Software transfer: Write EEPROM (booter)
DQA	Set the real-time clock
DQB	Read the real-time clock
DQC	Read error statistics
DQD	Delete error statistics
DQE	Internal commands: Read error information
DQF	Internal commands: Read EEPROM
DQG	Internal commands: Read out error stack

Command	Description
DQH	Internal commands Clear error stack
DQI	Internal commands: Write EEPROM
DQR	Internal commands: Read recovery information
DXa	Self-test commands
DYa	Internal commands
DYL	Internal commands: LSV status
DYR	Internal commands: Read internal statistics

Control block

The control block consists of:

- CPU
- Memory
- Serial interfaces
- Control functions

CPU

The CPU consists of an Intel 80C188XL microprocessor and an external clock generator (40 MHz).

Memory

When the power supply unit is off, memory is powered by a built-in battery. This ensures data and program retention even when the power supply unit has been switched off.

USB interface

USB module USBN9603 from National Semiconductor is used on the CMD_V4. This component has one standard endpoint (EP0) and a maximum of six additional endpoints (EP1 – EP6).

You will find information about the control procedure and data structure in the software manual for the CMD-V4.

Serial interface

The asynchronous serial interface and the associated driver/receiver modules has been implemented with a DUART chip.

You will find information about the control procedure and data structure in the software manual for the CMD-V4.

Status display

A 2-character, 7-segment display indicates the status of the CMD-V4.

Refer to the "Troubleshooting" chapter for the meaning of the status codes.

Function button

In some cases it is advisable to check whether the CMD-V4 is ready for operation without using additional tools.

For this purpose there is a function button on the controller – beneath the status display. When the button is pressed all possible functions are shown cyclically on the status display. To select a function, release the button when the required function is displayed.

Refer to the "Function test" section of the "Device Overview and Operation" chapter for more details.

Photosensor electronics

The photosensor electronics cover generation and control of the photosensor LED transmit stream and measurement of the receive voltage of the phototransistors.

The optimum values for the transmit stream and amplification of the evaluation logic are identified for every photosensor in the course of automatic initialization of the photosensor parameters. Amplification of the evaluation logic can be switched on four levels.

The transmit diodes are operated with pulsed current. The receive logic only evaluates the pulse. This reduces the influence of light from external sources on the receive signal.

The photosensors are polled one after another. Each photosensor operates with its own specific parameters (current and amplification). These parameters are constantly readjusted during operation. The photosensor parameters are stored in a table in CMOS and are not lost when the CMD-V4 is turned off.

Upon initial start-up or after clearing of the photosensor CMOS area, initialization takes place automatically when the device is turned on. Fo the initialization process it is essential for the light paths of all photosensors to be free. If this is not the case, error message <22> wil appear on the status display (see the "Troubleshooting" chapter).

Measuring banknotes with the double detection unit (DDU)

The DDU in the CMD-V4 is located in the upper dispensing unit. During transport, dispensed notes displace two touch levers with in-built magnets. The Hall sensors opposite them then generate a signal that corresponds to the note thickness.

The CMD-V4 records the note length and thickness when reference values are calculated.

The DDU can detect good individual and good double notes. Notes with measured values that are too different to the anticipated values are detected as bad and are not allowed to be presented to the customer. A bad note is stored temporarily in a compartment of the single reject switch (if available). Notes that slant excessively (more than 22 degrees) or long fanned out multiple notes (greater than 115 mm) are no longer allowed to enter the single reject compartments. These are transported directly to the clamp via the stacker wheel and then trigger a bundle reject.

In systems without a single reject function, every bad note leads to a bundle reject.

Component control

Dispensing unit control

Dispensing unit control is split up into:

- Logic for dispensing clutches, retaining springs and cassette stepper motors
- Photosensors for dispensing sensor and cassette empty sensor
- Pressure measurement including cassette present sensor

The CMD controller incorporates the control for up to two double dispensing units and two single dispensing units or for up to six single dispensing units. For the basic version of the CMD-V4 with two double dispensing units in the 4-cassette housing, the drivers for the dispensing clutches, retaining springs and cassette stepper motors are located on the 4-channel distributor board. Two connectors are available to connect two other 1-channel distributor boards with drivers for one further dispensing unit each. A distributor board is connected to the distributor board above it via its two connectors. This chaining tells the controller how many distributor boards there are, and the controller automatically derives the cassette positions.

Cassette control

Banknote pressure

Pressure is created by means of a stepper motor. When the required pressure has been built up with a current of about 0.8 A there is a switchover to a holding current of about 0.3 A.

Cassette identifier

Every cash-out cassette has a serial 64 x 16-bit EEPROM in its connector housing for the exchange of parameters. As far as data traffic is concerned, only one cassette is selected at a time. Serial data transfer can take place when the supply voltage has been turned on for the selected EEPROM.

Shutter module control

A shutter module can be attached to the controller as an option. Control of the shutter has been integrated in the CMD controller. It consists of the following parts:

- Shutter motor driver
- Receiver for the two shutter sensors
- Control of photosensors in the shutter

Safety switch

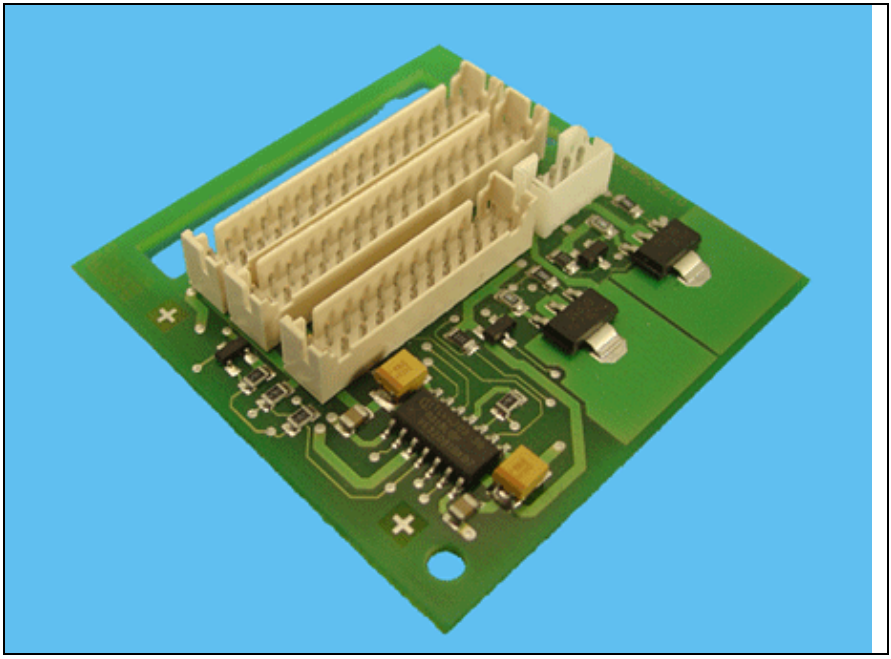
The safety switch monitors the home position of the CMD-V4; if the CMD-V4 is pulled out of the safe, it goes out of operation.

Locking switch

If the dispenser has not been pushed completely into the safe (status display <09>), the firmware prevents the clamp from being moved to the vertical cash-out position by querying the locking switch. This only applies to versions with a vertical output transport.

In the ProCash 5000 (mini) the locking switch is shorted by means of the system-specific cabling.

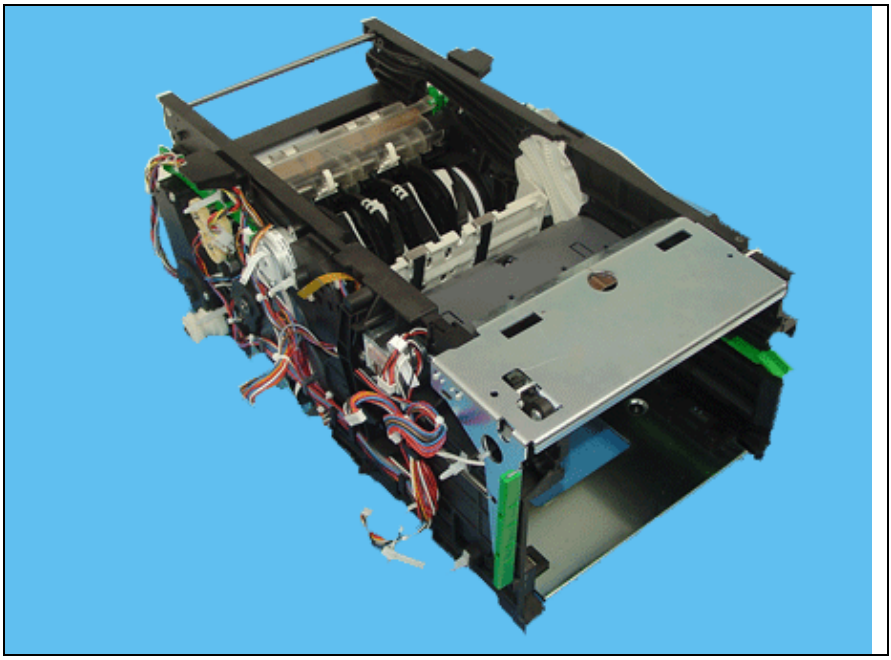
Extension board for the ProCash 5000 (mini)



The extension board (01750068065) is used in conjunction with the ProCash 5000 (mini) to control the additional CMD-V4 status display and the left and right user guidance on the customer panel.
This is used only if the ProCash 5000 (mini) is supplied without a system unit (PC).

Stacker transport

The stacker transport facility, with its retract function, is located in the upper rack. It can cope with all output variants. The variant is determined exclusively by the output transport facility. The single reject function is available outside EU countries.



The SAT collects intact notes in the clamp's stacking position. If the single reject function is available, bad notes are rejected individually (max. two bad notes per transaction). When there is no single reject function, a bad note is transported to the reject/retract cassette as part of a bundle reject.

Bundle output from the clamp's stacking position is controlled via the routing disk. The clamp is closed with the aid of the routing disk.

The clamp transports the bundle of notes along toothed wheel paths to the appropriate position. The drive motor for this is mounted on the clamp.

The routing disk determines the clamp's route as required. When the clamp reaches the customer output position the bundle of notes is transported out of the clamp with the aid of the in-built belts which are controlled via their own drive motor on the clamp.

If a bundle is not removed in time the retract function will transport it from the customer output position to the retract compartment of the reject/retract cassette. The SAT can transport bundles from the stacking position to the customer output position or to the reject/retract cassette, or from the customer output position to the retract compartment of the reject/retract cassette where they are stored unordered. The number of notes stored there is counted (providing there is a corresponding output transport).

As an option, a retracted bundle can be placed in the clamp's stacking position. If this option is used, however, no further device operations are possible until the bundle is removed by an operator and the software cancels the lock.

The transport belts in the SAT (not the clamp) are driven by the main motor that also drives the dispensing units.

The reject/retract cassette can simply be pushed into the SAT. The cassette engages in its final position and is locked. The cassette position is checked by means of a switch. A lever on the SAT is used to release the cassette.

The cash path can be seen and is accessible throughout the SAT.

The main motor can be lowered to gain access to the single reject compartment.

Stacker transport - EEPROM

For systems with firmware version 1500 or better and a USB booter, the EEPROM on the stacker transport is no longer essential.

The EEPROM is physically attached to the stacker transport (in the area of the stacker wheel).

The device variant (for example single reject) is stored in EEPROM if it cannot be recorded electronically.

The information is stored in EEPROM at the production plant.

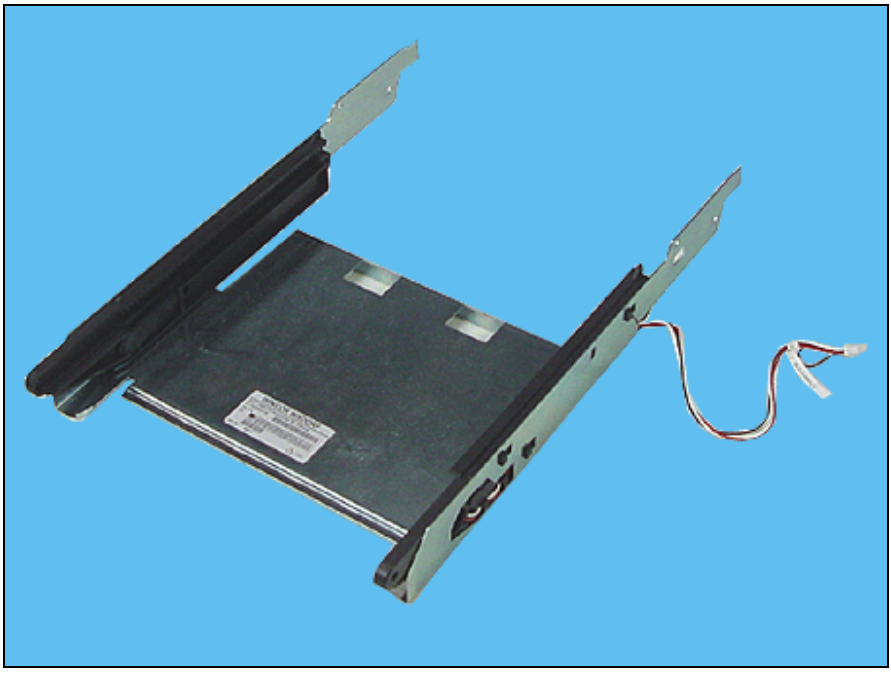
The following information is stored in EEPROM:

- Version of the EEPROM build
- Checksum
- Firmware name
- Serial number
- Type
- Hardware configuration of the CMD-V4
- Single reject configuration
- Routing disk positions
- Offset routing disk

i The EEPROM must always stay on the stacker transport.

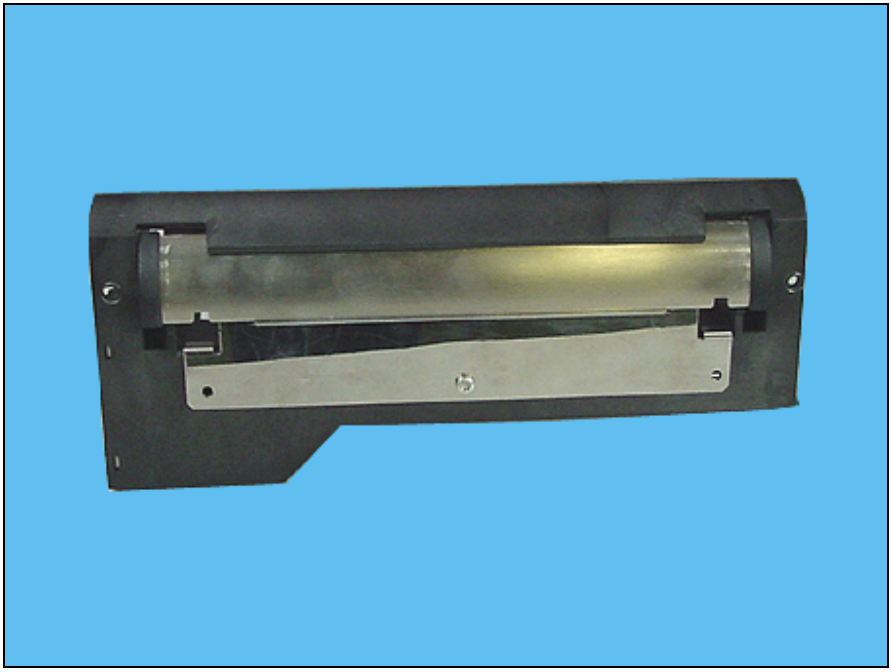
Output transport

The output transport facility varies depending on the device variant. The following illustration shows an output transport for a rearload device with horizontal cash-out. The output transport is attached to the stacker transport and driven via the CMD controller.



Shutter

The shutter is a flap to keep cash under cover. It is controlled via the CMD controller.

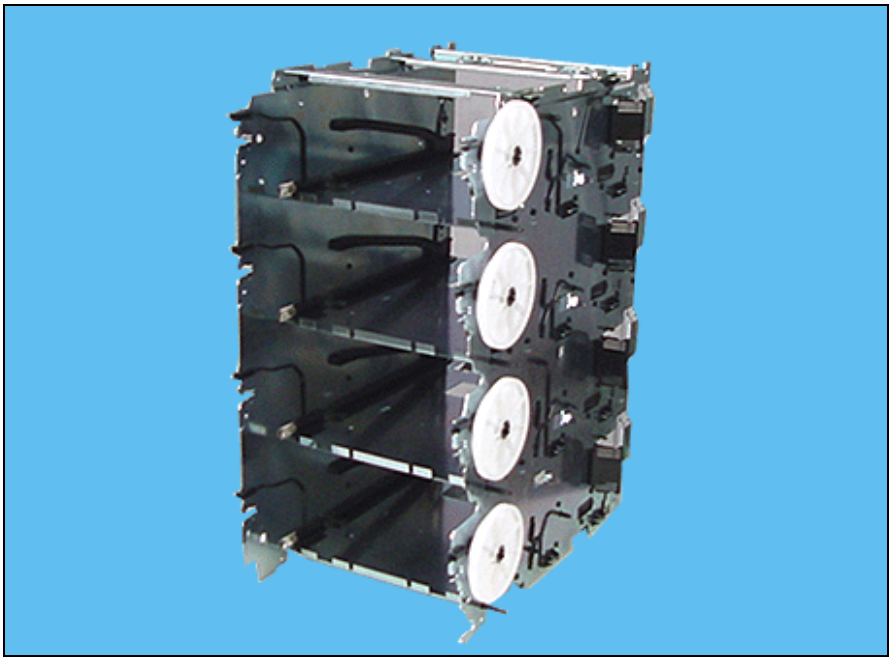


Dispensing unit

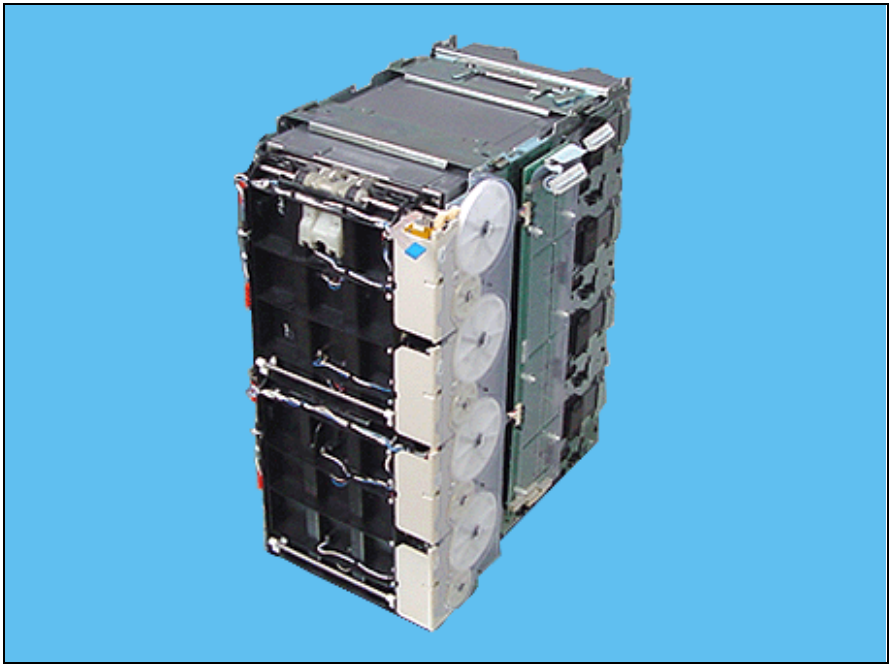
Various models (indoor / outdoor, frontload / rearload) and a variable number of dispensing units (1-6) are available so every user can select the right device configuration.

A thickness measuring station must be located in the top dispensing unit. This station checks whether double or overlapping notes have been dispensed.

4-cassette housing without dispensing units



4-cassette housing with two double dispensing units and 4-channel distributor board



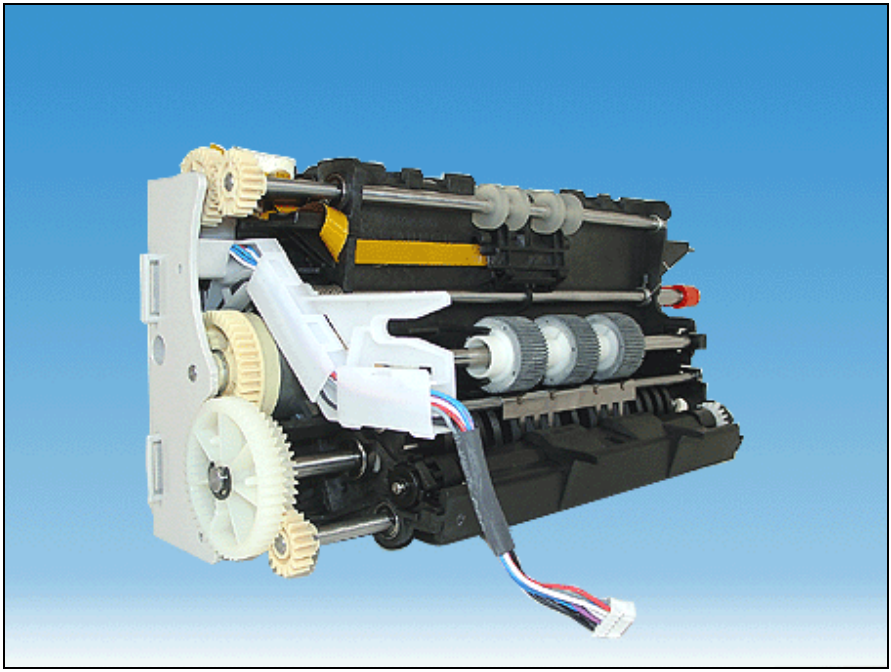
Every 4-cassette housing contains four cassette mounts and at least one dispensing unit featuring a thickness measuring station. The second dispensing unit is used when more than two cassettes are configured.

The thickness measuring station must always be in the upper dispensing unit.

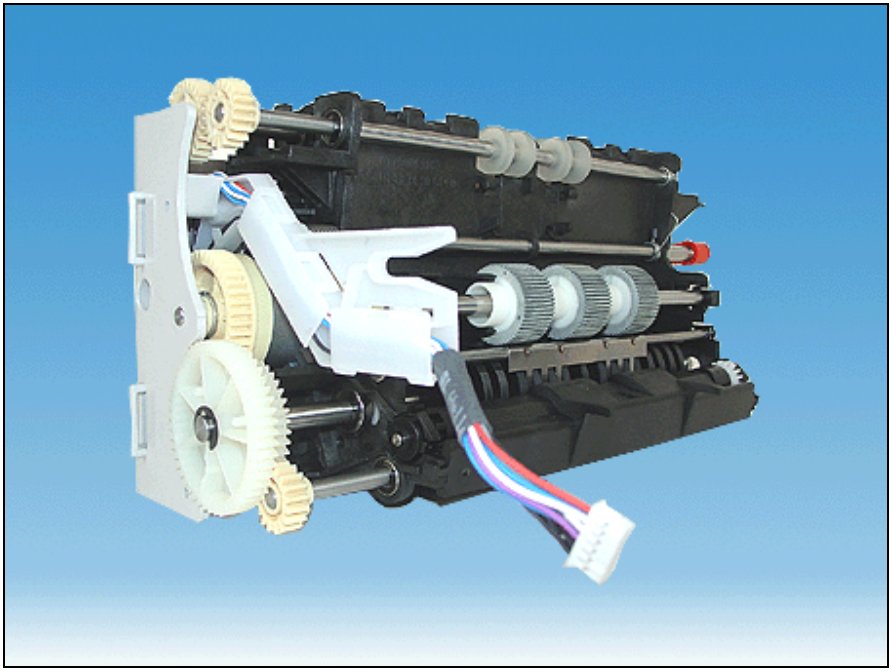
i If there is only one double dispensing unit in a 4-cassette housing the requisite jumper has to be connected on the CMD controller.

The pressure that the notes exert on the dispensing shaft is identified via a pressure sensor. Banknotes are dispensed downward by means of friction. In each case, the dispensing unit extracts just one note and transports it to the stacking transport facility. There is a minimum gap of 67 mm between two successive notes. Subsequent notes are held back by a retaining shaft that is actuated by a magnet.

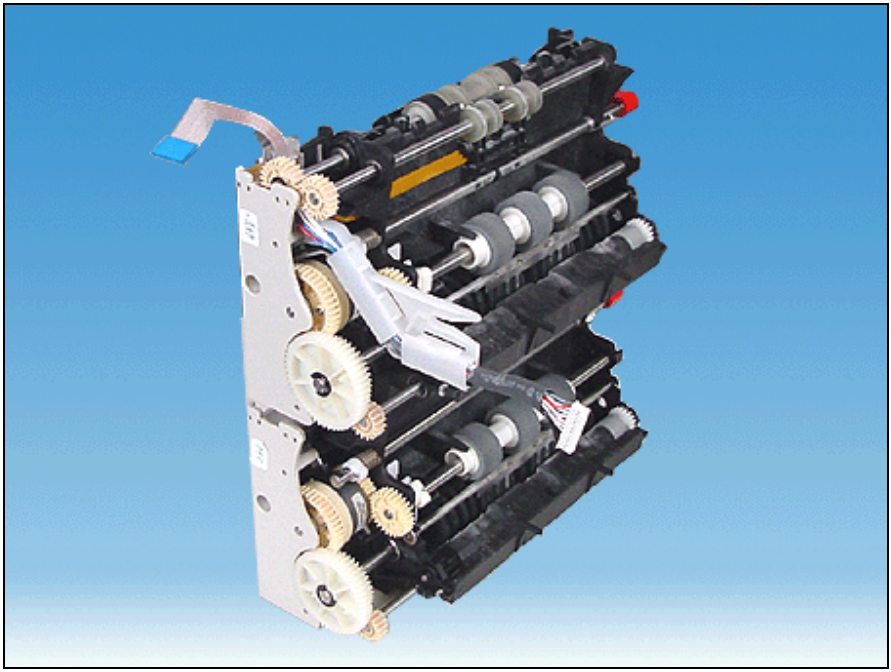
Single dispensing unit with DDU



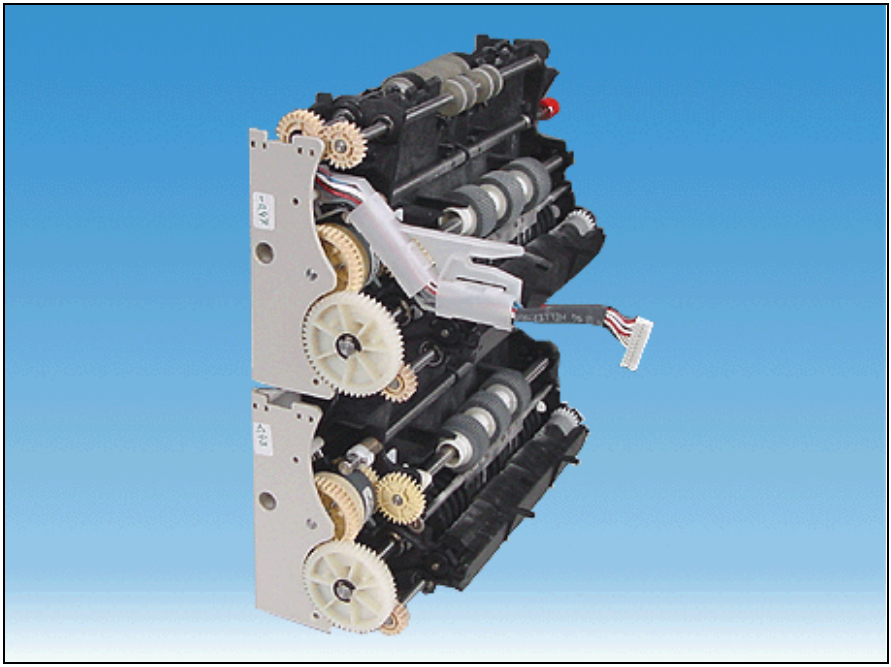
Single dispensing unit without DDU



Double dispensing unit with DDU



Double dispensing unit without DDU



A pendulum dispensing shaft is used in dispensing the notes. Each dispensing shaft is driven by the main motor and its own magnetic clutch. At one end of the dispensing shaft there is a pressure sensor that is used to poll the note pressure and the 'Cassette inserted' message. Forward movement is achieved via an additional roller in the cassette. An extended inlet slope in the cassette results in pre-separation.

The cassettes can simply be pushed into the housing with dispensing unit(s). The cassette engages in its final position and is locked. The cassette position is polled via the pressure sensor. The cassettes can be unlocked via the unlocking lever on the housing.

Voltages and signals are passed from the controller to the cassette via the cassette connector.

The following elements are controlled in the dispensing unit:

- Extractor gear
- Retaining magnet
- 'Cash dispensing' photosensor
- 'Cassette empty message' photosensor
- Pressure sensor for 'Cassette inserted' and 'Note pressure'

Adjustment eccentric

The adjustment eccentric is part of the dispensing unit and is used to adjust the dispensing gap. There are three positions for the eccentric: A, B and C. Position A is set whenever systems are first shipped. If a replacement dispensing unit is delivered, it is allowed to be in position B at most.

If double dispenses become more frequent with the CMD-V4, the gap can be reduced for the dispensing unit in question by increasing both eccentrics (right and left of the shaft) by one level, for example from A to B. If the dispensing gap is set too high, it is impossible to dispense from the cassette.

Photosensors in the dispensing unit

The PSE message (photosensor empty) is output when there are no more notes in the cassette. The photosensor beam is sent to the receiver in the dispensing unit via a prism in the cassette's pressure carriage.

Pressure sensor

The pressure sensor (PSD) returns the position as an analog value, and thus the pressure of the dispensing shaft. It can also determine whether the cassette is present.

Reject / retract cassette

The reject / retract cassette contains two separate compartments in which notes can be placed under software control. The compartment is selected by a lifting magnet in the SAT. The reject / retract cassettes are equipped with a tamper indicator. The status of the tamper indicator can be checked in a window in the back panel.

When the cassette cover is open, the retract compartment can be swung to the note removal position by means of a lever.

The reject cassette is largely identical to the reject / retract cassette, except that in this model the retract compartment has been omitted. The following text will use the term “reject / retract cassette” for both types.

The reject / retract cassette is available in two versions. Depending on the version, they can be opened by means of a key or a toggle. Both versions can be lead-sealed.

A reject/retract cassette that has been tampered with cannot be used in the SAT any more. The cassette is stopped if any subsequent attempt is made to insert it. A display window on the back of the cassette indicates the status:

Green: Cassette ready to be inserted
Blue: Cassette has been opened by force

The insertion mechanism is installed at the front. The notes are inserted in a slanted position from above at the front. A toothed wheel on the right-hand cassette side drives two intake rollers which transport the individual notes or bundles into the cassette.

The feed area of the reject / retract cassette is opened on insertion into the SAT by means of side tappets that are moved in side panels in the SAT. The cassette shutter is designed as a visor.

In its final position the cassette is locked; a switch reports that this position has been reached. The two cassettes are released after being unlocked manually.

Cash-out cassettes

Cash-out cassettes are available in two versions. Depending on the version, it can be opened by means of a key or a lever.

The cash-out cassettes are equipped with a tamper indicator. The status of the tamper indicator can be checked in a window on the cassette handle side.

Any subsequent attempt to insert the cassette with an open visor is stopped. If the indicator is blue and the visor is closed, the cassette can be inserted in the CMD-V4. Cash can be dispensed.

The tamper indicator can be reset by opening the lid. A display window on the cassette handle side indicates the locking status:

Green: Cassette ready to be inserted
Blue: Cassette was tampered with

The output area of the cash-out cassette is opened on insertion by means of side tappets that are moved in side panels of the housing.

The cassette shutter is designed as a visor. The pressure is created by a pressure carriage operated by a stepper motor. The pressure carriage is guided in the side panel of the cassette.

The cassette number is preset at the production plant before shipment. It is stored in EEPROM and can be changed via a software command.

The cassette has a connector on its side panel to connect the EEPROM and the stepper motor. The EEPROM itself is located in the connector housing.

An adhesive label can be affixed to a recess on the handle side of the cassette in order to identify the cassette (denomination, cassette number, etc.).

The denomination is lasered into the cassette if it is configured at the production plant.

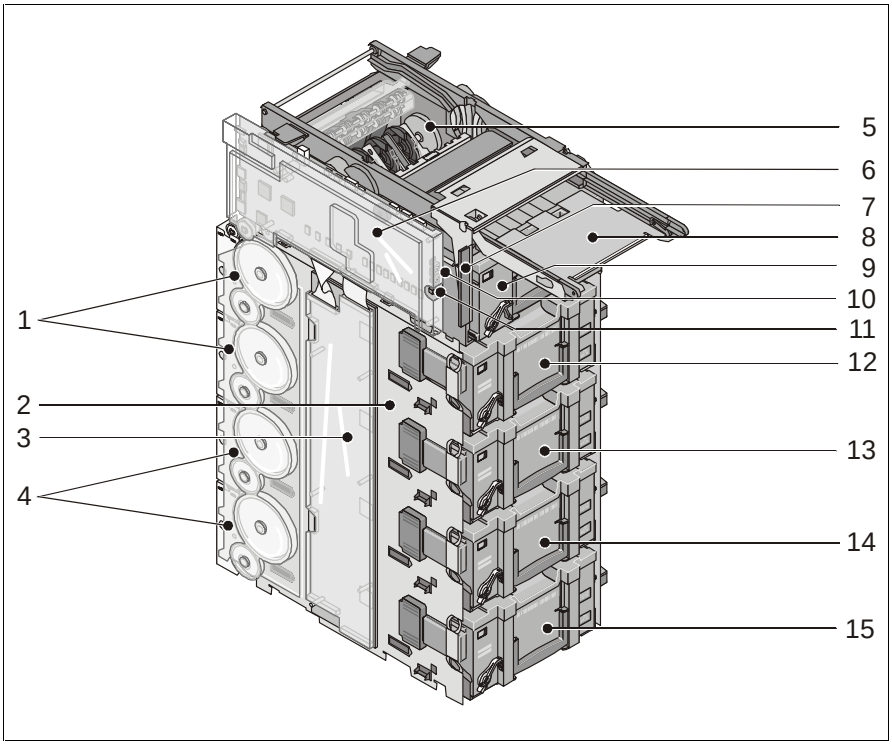
The following cassette variants are available:

	Toggle	**Lock**	**Seal**	**Tamper indicator**	**Ink Dye (integrated maculation system)**
Standard	X		X	X	
Security I		X	X	X	
Security II		X	X	X	X

Device Overview and Operation

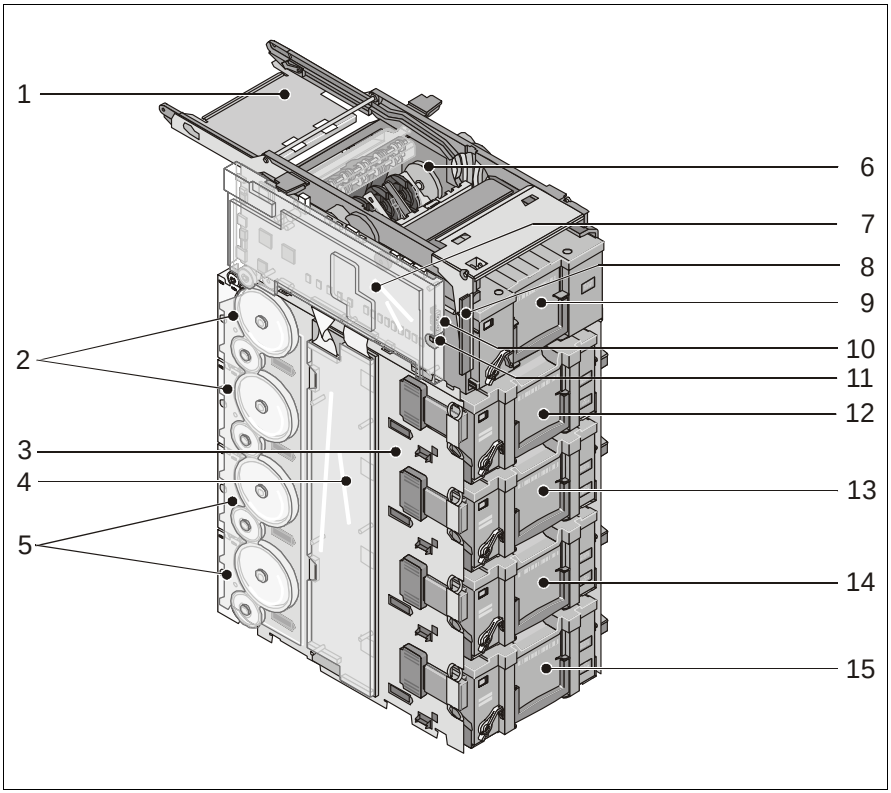
Device overview

Horizontal cash-out Frontload



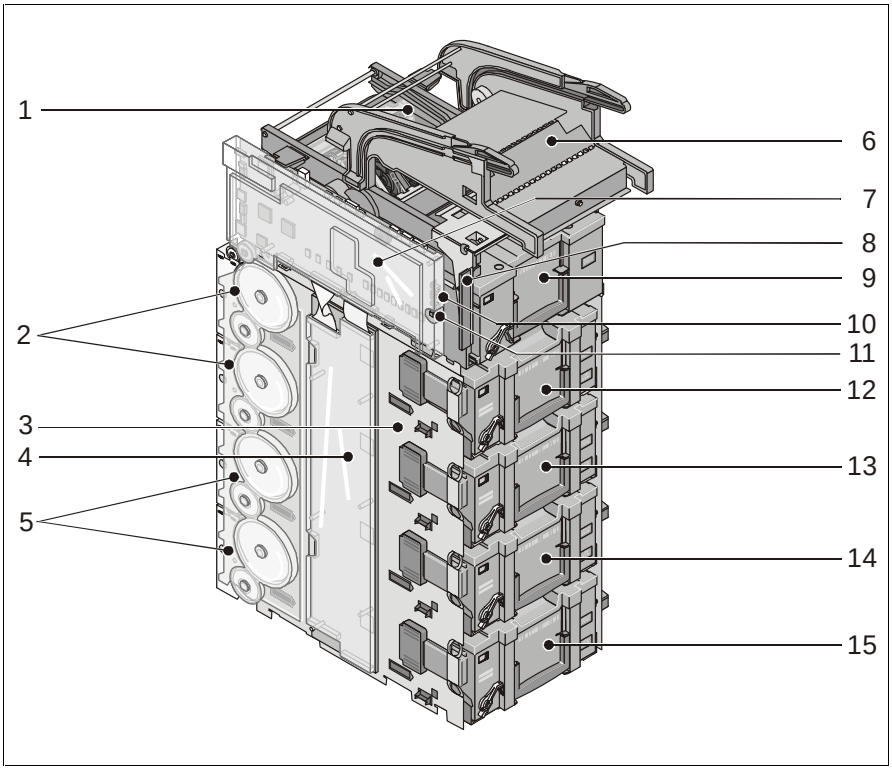
1 Double dispensing unit with DDU
2 4-cassette housing
3 4-channel distributor board
4 Double dispensing unit
5 Stacker
6 CMD controller
7 Release lever
8 Horizontal output transport FL
9 Reject / retract cassette
10 Status display
11 Function button
12 Cash-out cassette 1
13 Cash-out cassette 2
14 Cash-out cassette 3
15 Cash-out cassette 4

Horizontal cash-out Rearload



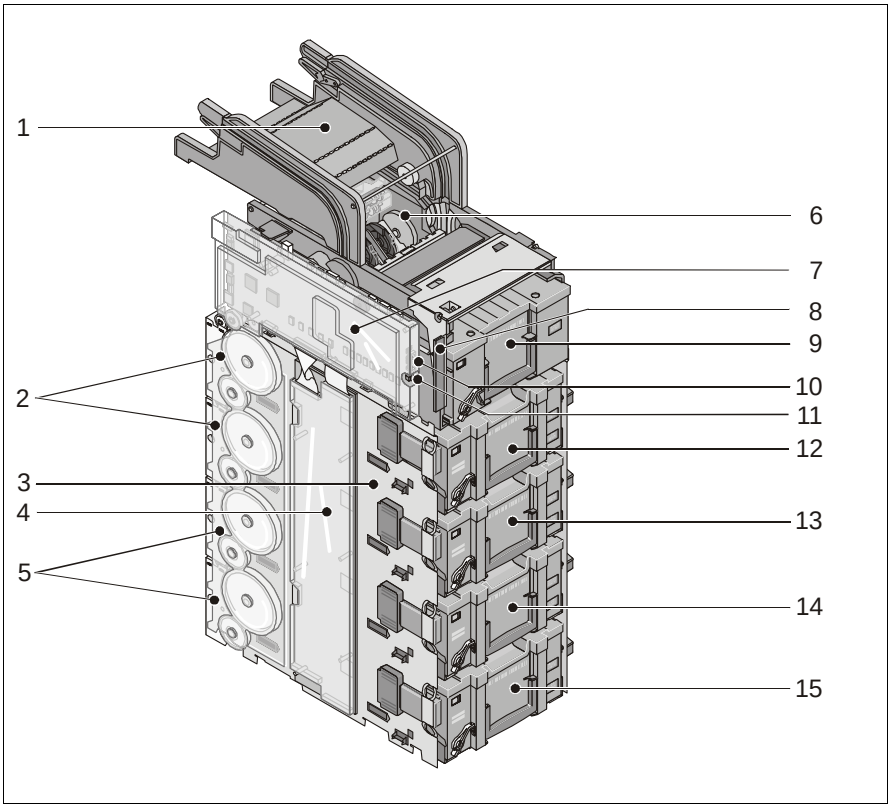
1 Horizontal output transport RL
2 Double dispensing unit with DDU
3 4-cassette housing
4 4-channel distributor board
5 Double dispensing unit
6 Stacker
7 CMD controller
8 Release lever
9 Reject / retract cassette
10 Status display
11 Function button
12 Cash-out cassette 1
13 Cash-out cassette 2
14 Cash-out cassette 3
15 Cash-out cassette 4

Vertical cash-out Frontload



1 Stacker
2 Double dispensing unit with DDU
3 4-cassette housing
4 4-channel distributor board
5 Double dispensing unit
6 Vertical output transport FL
7 CMD controller
8 Release lever
9 Reject / retract cassette
10 Status display
11 Function button
12 Cash-out cassette 1
13 Cash-out cassette 2
14 Cash-out cassette 3
15 Cash-out cassette 4

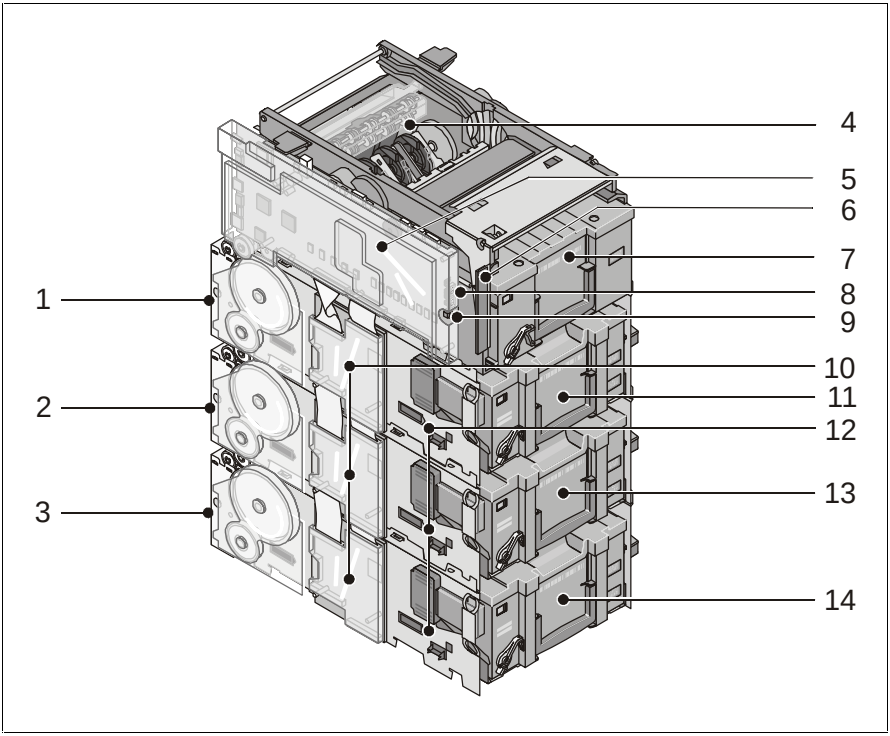
Vertical cash-out Rearload



1 Vertical output transport RL
2 Double dispensing unit with DDU
3 4-cassette housing
4 4-channel distributor board
5 Double dispensing unit
6 Stacker
7 CMD controller
8 Release lever
9 Reject / retract cassette
10 Status display
11 Function button
12 Cash-out cassette 1
13 Cash-out cassette 2
14 Cash-out cassette 3
15 Cash-out cassette 4

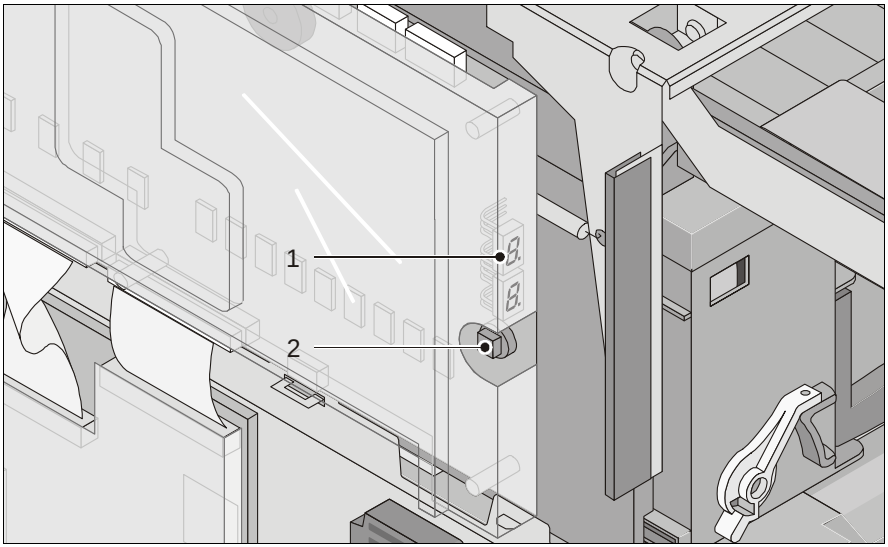
1-cassette housing with single dispensing unit

The following figure shows three 1-cassette housings with one single dispensing unit featuring a thickness measuring station (DDU), and two plain single dispensing units. The CMD-V4 with 1-cassette housings can be shipped in all variants that are available for 4-cassette housings (see figures above).



1 Single dispensing unit with DDU
2 Single dispensing unit
3 Single dispensing unit
4 Stacker
5 CMD controller
6 Release lever
7 Reject / retract cassette
8 Status display
9 Function button
10 1-channel distributor board
11 Cash-out cassette 1
12 1-cassette housing
13 Cash-out cassette 2
14 Cash-out cassette 3

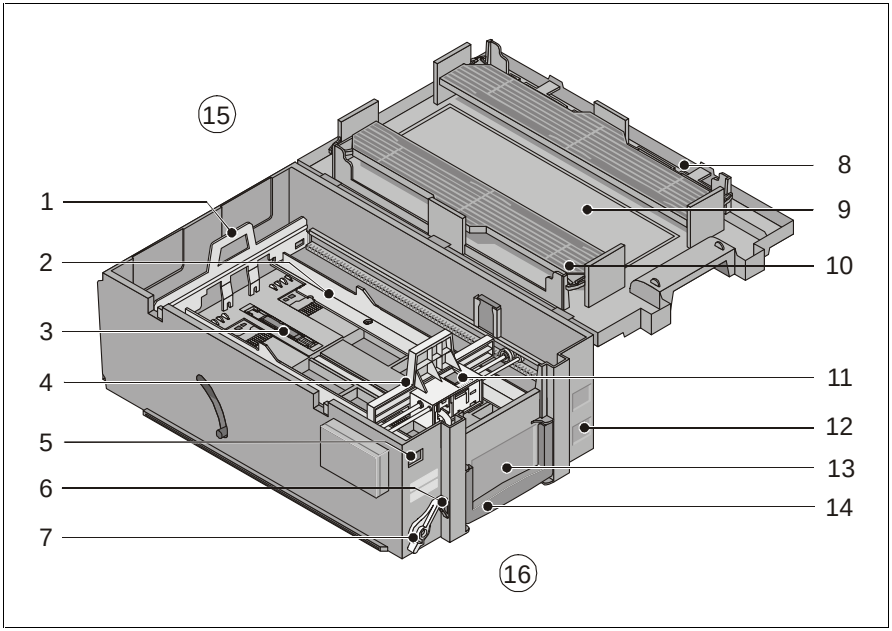
Function elements and controls



1 Status display (two 7-segment displays, first digit above)
2 Function button

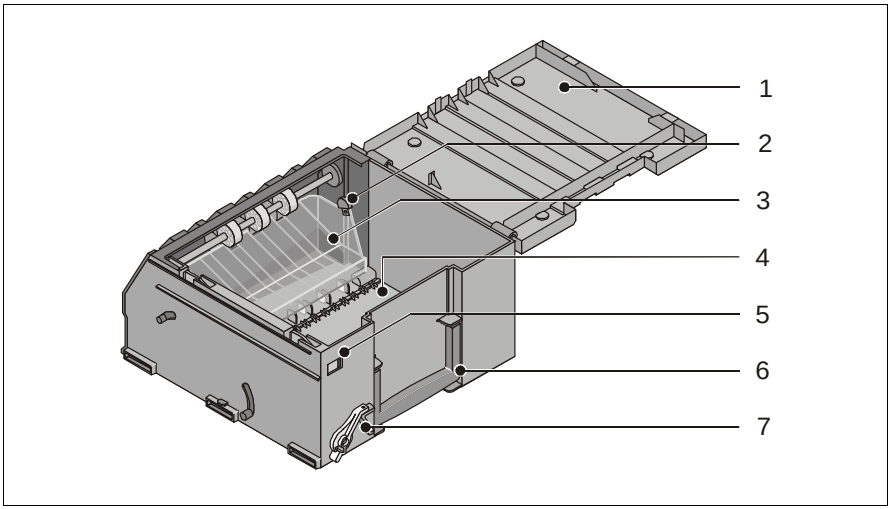
The cassettes

Cash-out cassette



1 Pull-back handle
2 Banknote rail
3 Slide for low cash sensor (optional)
4 Pressure carriage
5 Tamper indicator blue/green
6 Sealing device
7 Locking/unlocking lever / lock
8 Box lid
9 Refill notes
10 Inset for setting the banknote height
11 Latching button
12 Free space for validity identification
13 Free space for cassette label
14 Cassette handle
15 Dispensing side
16 Side of cassette handle

Reject / retract cassette



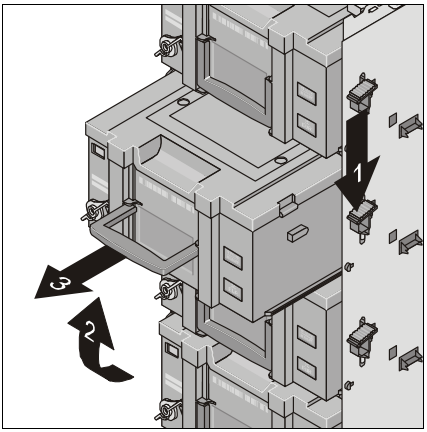
1 Box lid
2 Retract compartment lever
3 Retract compartment
4 Reject compartment
5 Tamper indicator blue/green
6 Cassette handle
7 Locking lever (optional lock)

Removing the cassette

i Before cassettes can be removed, the current transaction must be terminated as defined.
The procedure for removing cash-out cassettes and reject/retract cassettes is the same.

- Activate the product-specific software (see chapter "Basic Operation", section "Calling the product-specific software" in the operating manual of the basic device).
- Open the safe door (see the operating manual of the basic device).

To remove the cassettes from the CMD-V4:



Press the green releasing tab on the right side of the cassette (1).

The released cassette is automatically pushed out of the dispenser by several centimeters.

Raise the cassette handle (2) and pull the cassette out of the CMD-V4 by the handle (3). While pulling the cassette, support it from underneath with your free hand.

Transporting the cassette

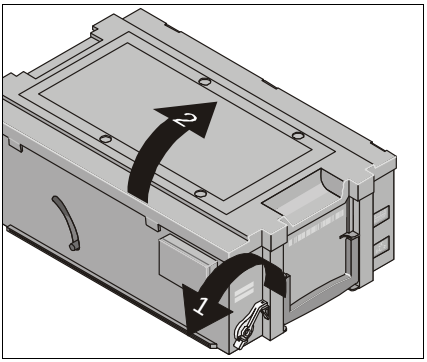
i Make sure that the cassette(s) are not damaged during transport. It is therefore important to note the following notes:

- Do not drop the cassette(s)
- Do not throw the cassette(s)
- Only transport the cassette(s) in their home position
- Do not leave the cassette(s) loose during transport
- Do not stack the cassette(s) too high

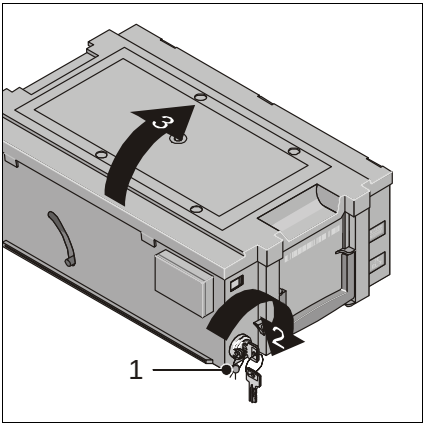
Opening the cassette

i The procedure for opening cash-out cassettes and reject/retract cassettes is the same.

- Remove the cassette (see section "Removing the cassette").



When the cassette does not have a lock, turn the green locking lever in the direction of the arrow (1) and lift the cassette lid in the direction of the arrow (2).



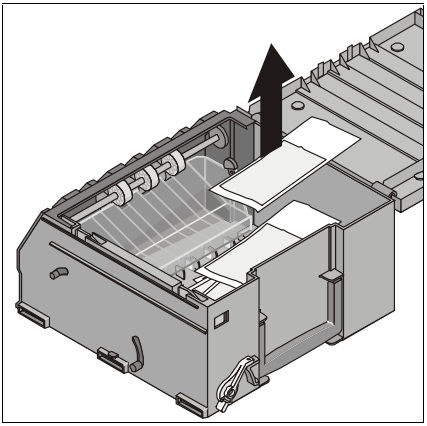
Remove any seal (1) on a cassette with a sealable lock. Insert the cassette key into the cassette lock, turn the key to the right as far as possible (2) and lift the cassette lid in the direction of the arrow (3).

Emptying the reject / retract cassette

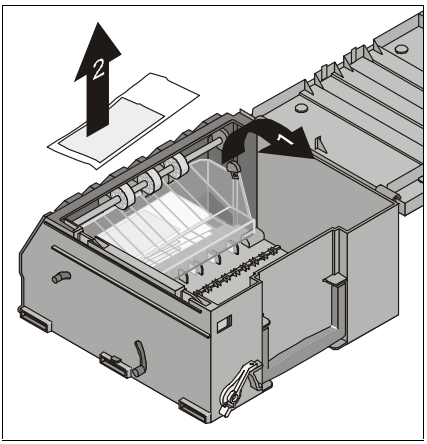
The reject / retract cassette is divided into a reject and a retract compartment.

Banknotes which are not removed by the customer after the cash dispensing procedure are returned to the retract compartment. Cash which has been incorrectly dispensed or which was dispensed for test purposes is stored in the reject compartment.

- Remove and open the cassette (see section "Opening the cassette").



Remove the banknotes from the cassette's reject compartment.



To empty the retract compartment, push the green lever in the direction indicated as far as possible and hold it down. You can remove the cash from the retract compartment with your other hand (2).

Setting the low cash sensor

As an option, the cash-out cassettes can be equipped with a low cash sensor.

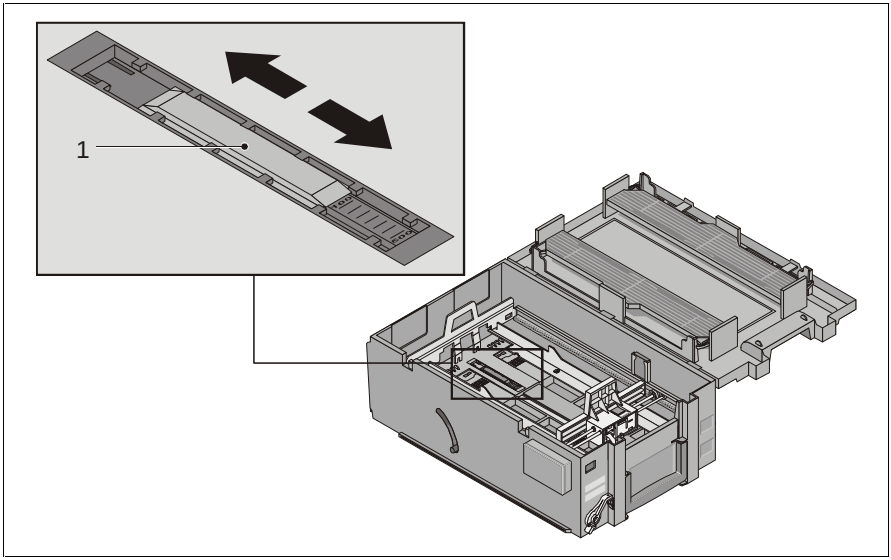
With this function, a microswitch reports to the connected device that the cassette only contains a certain number of banknotes.

To set to the desired minimum banknote quantity, proceed as follows:

- Remove and open the cassette (see section "Opening the cassette").
- Remove any notes you may find.
- Set the slide (1) manually (see arrow) to the desired minimum banknote quantity.

i The minimum banknote quantity can be set between 50 and 550 (in steps of 50) via the green mechanical slide (1).
Setting ’0’ means that the function is deactivated.

The example shows the setting for 100 banknotes.

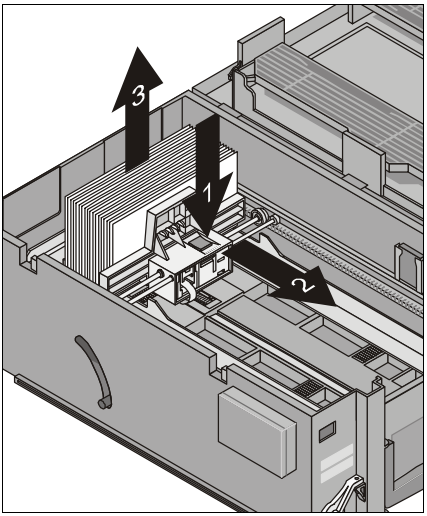


Setting the banknote width

The banknote width has to be set before the cassette is used for the first time or when a different currency or denomination is used in the cassette.

- Remove and open the cassette (see section "Opening the cassette").

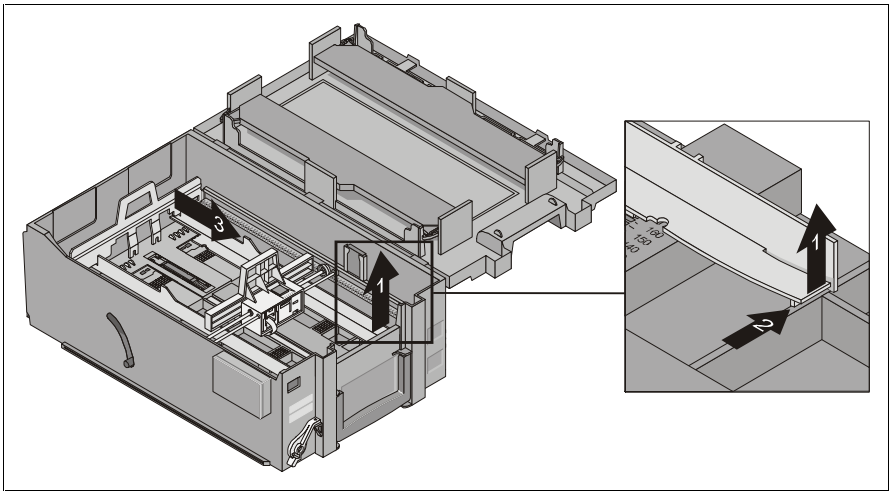
Removing banknotes



Press the green latching button (1) while pushing the pressure carriage slightly forward to release the return lock.

Push the pressure carriage towards the center (2). Remove any banknotes (3).

Removing the banknote rails

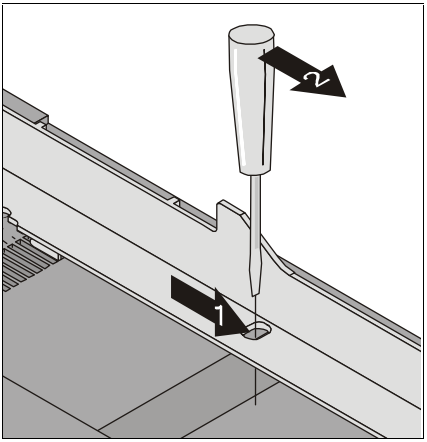


- Pull up the horizontal tab at the end of the banknote rail to lift the catch (2) above the crosspiece underneath the tab. At the same time push against the nose of the rail (3) with the thumb of your other hand in the direction of the cassette handle.

i The left rail and the right rail are inserted in the same way.

Should the rail be difficult to remove, proceed as follows:

- Pull up the horizontal tab (1) at the end of the banknote rail to lift the catch (2) above the crosspiece underneath the tab (see illustration in the section "Removing the banknote rails").



Put the tip of a screwdriver in the hole in the rail (1) and use it as a lever to move the rails in the direction of the arrow (2).

Removing the banknote rail – note width less than 110 mm

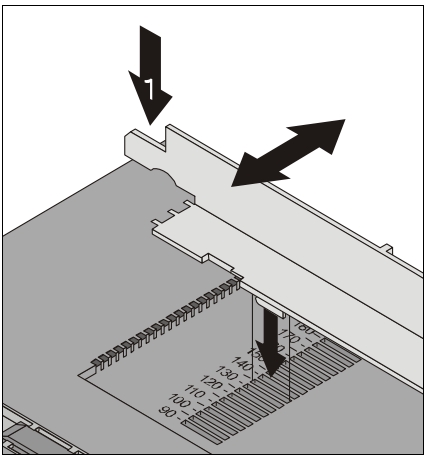
If the banknote rail is set to a banknote width of less than 110 mm, proceed as follows:

- Push the pressure carriage approximately to the center of the cassette (see section "Removing banknotes").
- Pull up the horizontal tab at the end of the banknote rail to lift the catch (2) above the crosspiece underneath the tab. At the same time push against the nose of the rail (3) with the thumb of your other hand in the direction of the cassette handle (see section "Removing the banknote rails").
- Push the pressure carriage all the way to the other end of the cassette, i.e. the one from which the banknotes are dispensed.
- Lift the end of the rail a little and push it outwards towards the long side of the cassette. If you hold the rail in this position you can push the pressure carriage to the opposite end of the cassette, which has the cassette handle.
- Lift the rail on the other side, too.

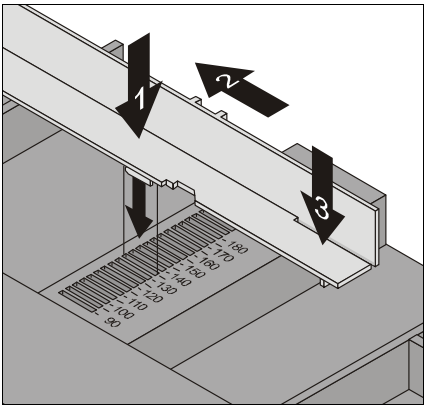
Inserting the banknote rails

i In the following figures a banknote width of 133 mm is assumed resulting in a rail setting at 135 mm on the scale.

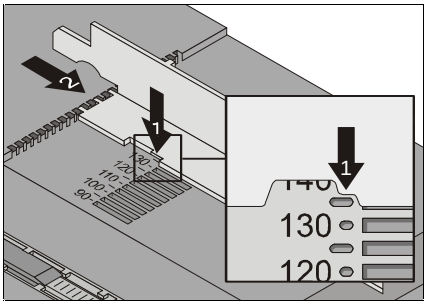
The left rail and the right rail are inserted in the same way.



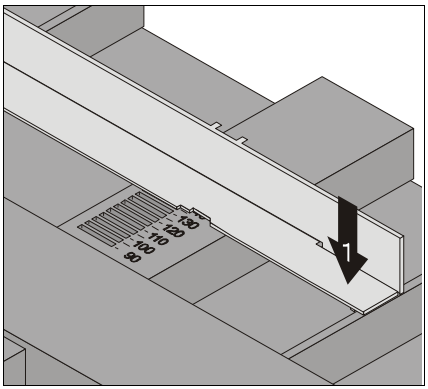
Slide the protruding end of the rail (1) under the lower edge of the pull-back handle if necessary and press the rail (on the dispensing side of the cassette) into the slot for the required banknote width.



Then push the rail into the corresponding slot on the cassette handle side. Press down on the banknote rail (1) near the scale while pushing it in the direction of the dispensing side (2). Now push the loose end (3) down until it snaps into place.



The banknote rail is correctly inserted if the desired setting is placed in the small cutout (1) and the rail is correctly hooked in (2).

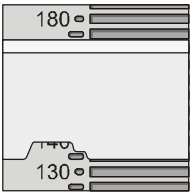
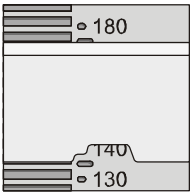
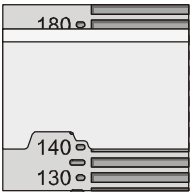
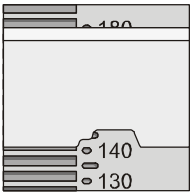


The tab of the rail (1) must lie flat on the crosspiece.

i Make sure that both rails are set to the **same** note width at all four positions.

If you have no information concerning the size of the banknotes used, measure the banknotes in millimeters. Round up this value to the next higher value on the scale and insert the rail at that position.

Examples for setting the rail:

Dispensing side	Side of cassette handle	
		Banknote width 133 mm - rail is set to 135 mm on the scale
		Banknote width 137 mm - rail is set to 140 mm on the scale

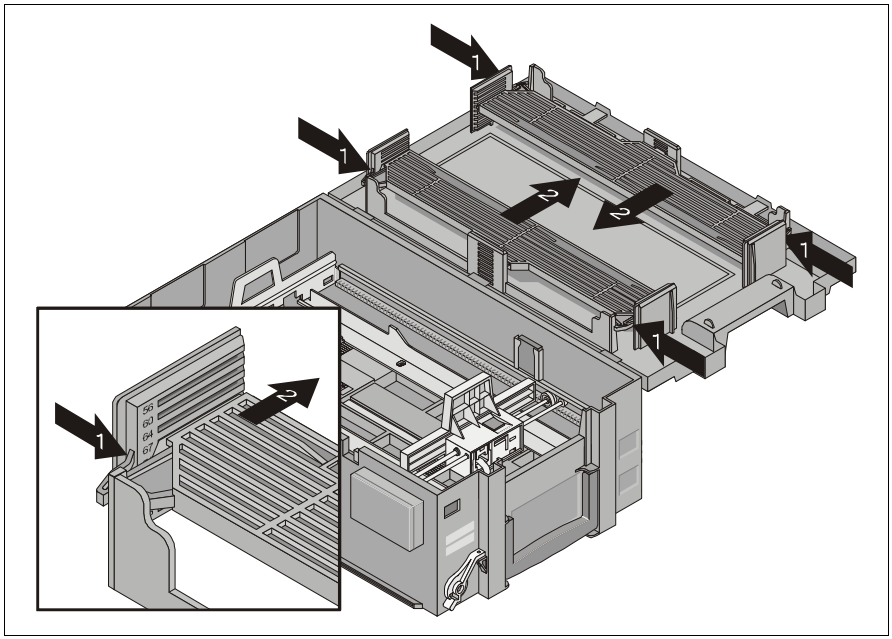
Inserting the banknote rail - note width less than 110 mm

If the banknote width is less than 110 mm, please proceed as follows:

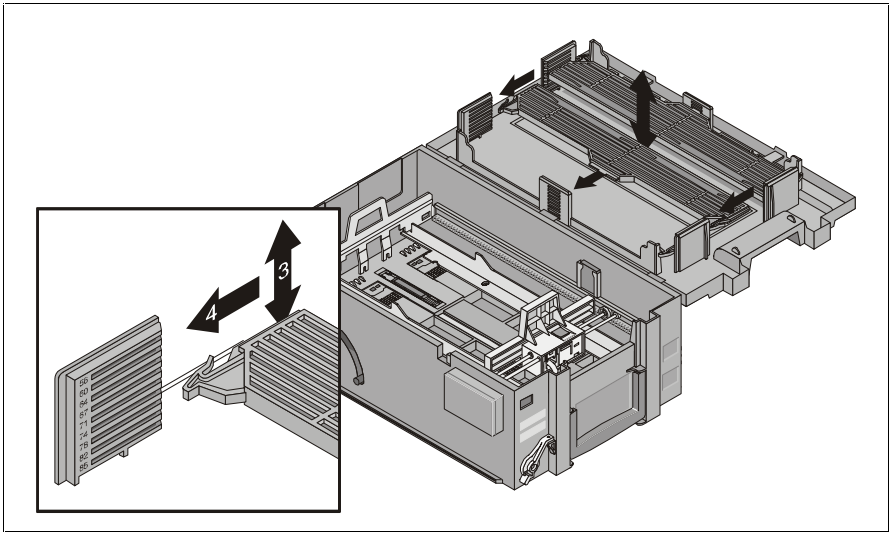
- Push the pressure carriage all the way to the end of the cassette which has the cassette handle (see section "Removing the banknotes").
- Insert the rail in the desired slot in front (cassette end from which notes are dispensed), and press the rail in the rear (cassette handle end) outwards to the side.
- Press the rail down in the center.
- Push the pressure carriage to the center of the cassette and press the rail in the proper slot of the scale in the rear (cassette handle end). Push the tab down until it snaps into place.

i When the banknotes are inserted, there is automatically a gap between the notes and the rails.

Setting the banknote height



- Press the two catches (1) towards each other and remove the inset (2) in the direction of the lid center.



- Set the required note height (3) and push the insets back in (4) until they snap into place.

i Make sure that the insets are set to the **same** note height at all six positions.

If you have no information concerning the size of the banknotes used, measure the banknotes in millimeters. Round up this value to the next higher value on the scale and place the inset in that position.

Examples:

Note height 72 mm - inset at 74 mm

Filling the cash-out cassette

Filling the cash-out cassettes includes the following steps:

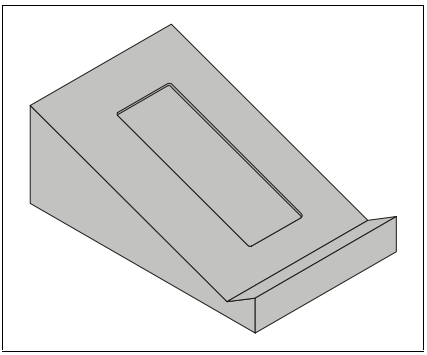
- Preparing the cash-out cassette
- Preparing the banknote bundles
- Inserting banknote bundles

i In general, all banknotes complying with the requirements of the national bank are suitable for use in the cash-out cassette.

To ensure error-free dispensing, fill the cash-out cassette only with intact and carefully prepared banknote bundles which only contain notes of the same value.

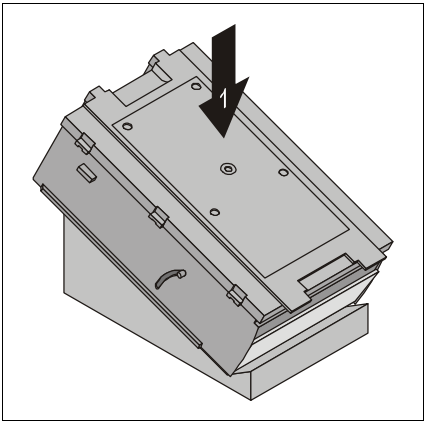
Preparing the cash-out cassette

Use the loading aid shown in the picture below to fill the cash-out cassette.



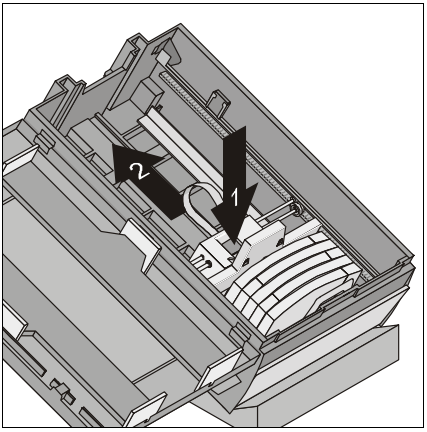
The loading aid facilitates the filling process and prevents that the inserted banknotes / banknote bundles fall over.

(Loading aid order number: 7595300720)



Remove the cash-out cassette from the CMD-V4 (see section "Removing the cassette").

Place the cash-out cassette (1) on the loading aid as shown in the picture, and open the cassette lid (see the section "Opening the cassette").



Press the green latching button (1) and push the pressure carriage slightly forward to release the return lock.

Then pull the pressure carriage back up to the top cassette edge towards the side with the cassette handle (2).

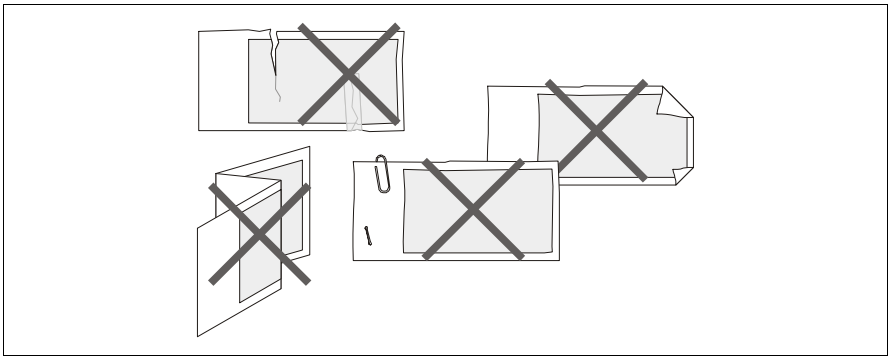
- Set the low cash sensor (if available) to the desired minimum banknote quantity (see section "Setting the low cash sensor").
- Fill the cash-out cassette following the instructions provided in the following sections.

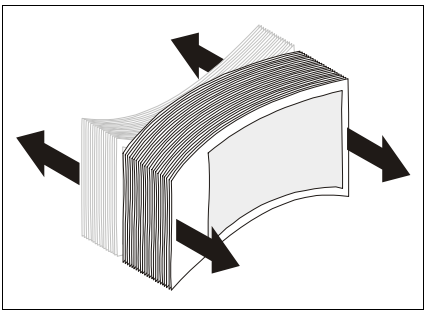
Preparing the banknote bundles

Check the banknotes for damages before you put them into the cash-out cassettes.

Sort out the damaged banknotes and/or remove clips, needles or other foreign objects.

i The following banknotes should be rejected: torn, glued, folded, creased, stapled or clipped banknotes.



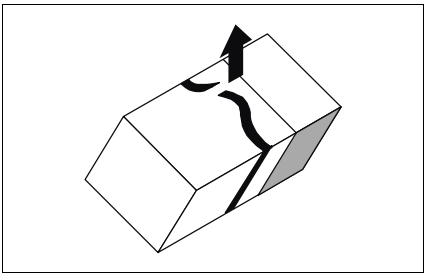


If you use new banknotes / banknote bundles, you must separate the banknotes at the cut edges. Carefully fan the banknote bundles and bend and twist them repeatedly in various directions.

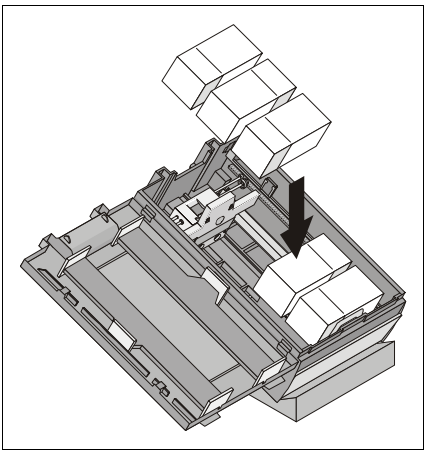
Inserting banknote bundles

i Also follow the instructions for filling the cash-out cassette on the inside of the cassette cover.

General instructions for filling the cassette

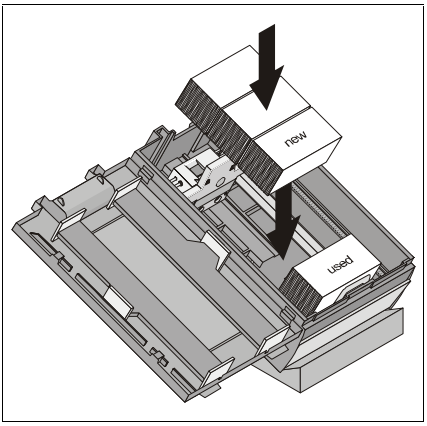


Remove any existing bank wrappers made of paper, plastic or rubber before inserting the banknote bundle.



You should always insert the banknote bundles into the cash-out cassette so that the silver stripes or other raised embossing of the individual bundles are alternately pointing to the left and to the right.

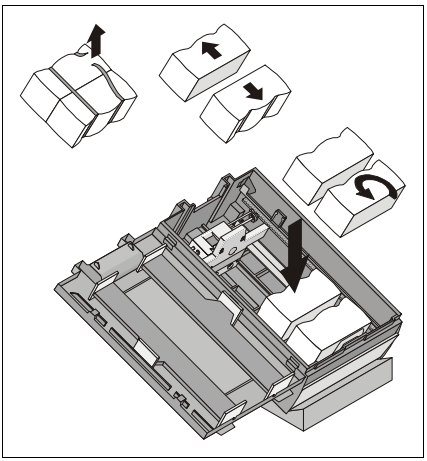
New and used banknote bundles



If you use new and used banknote bundles in one cassette, always insert the bundles with the used banknotes into the cassette first.

Then insert the bundles with the new banknotes after you separated them at the cut edges (see the section "Preparing the banknote bundles").

Deformed banknote bundles

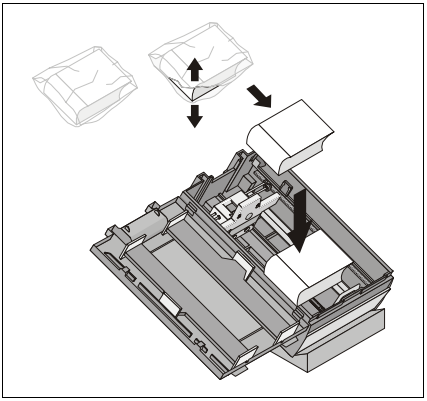


Insert banknote bundles which were deformed by packaging (bands with paper, plastic or elastic bands) as follows:

Split the banknote bundle and turn the first half of the bundle so that the bent side is pointing towards the pressure carriage.

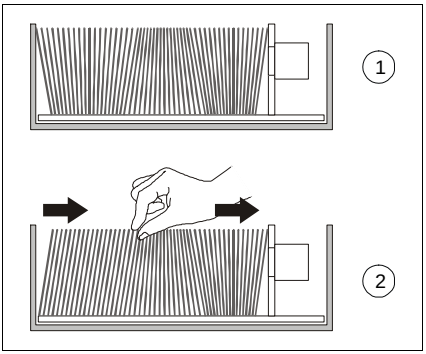
Insert the two bundle halves into the cassette as shown in this picture.

Please do not use any extremely deformed banknotes.



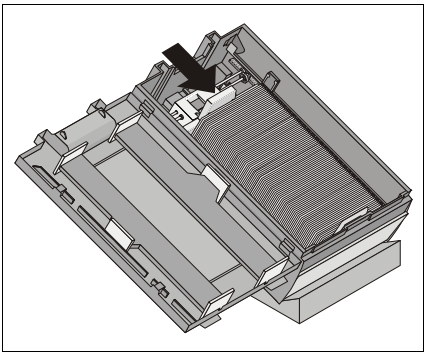
Always insert banknote bundles which are bent horizontally into the cash-out cassette in such a way that the side of the bundle bulging out is pointing towards the pressure carriage.

Take the banknote bundles from the packaging, fan the banknotes and put them into the cassette as shown in the picture.



The banknotes are now positioned in the cash-out cassette as shown in figure (1).

Stroke across the banknotes towards the pressure carriage as shown in figure (2).



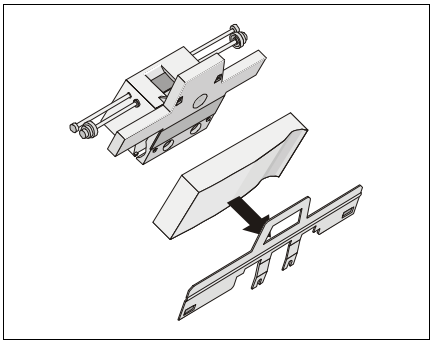
Press the green latching button on the pressure carriage, and push the carriage against the banknotes far enough to prevent them from falling over. The inserted banknotes do not need to be pressed together.

- Close the cash-out cassette and re-insert it (see section "Inserting the cassette").

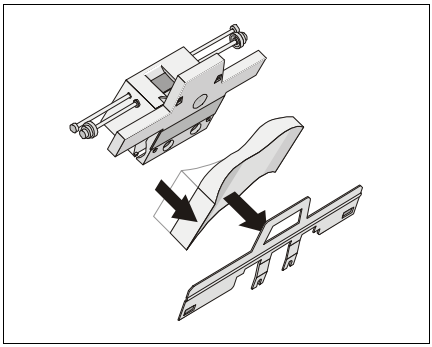
Special comments for deformed banknotes

Possible deformation of banknotes

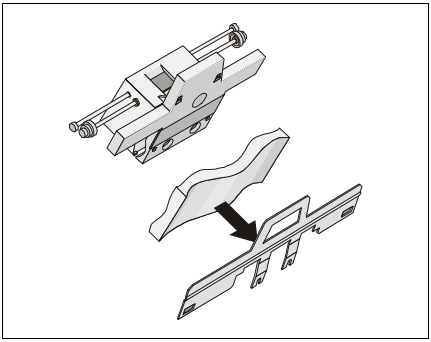
Type A: Deformation near the hologram	**Type B:** S shape	**Type C:** Wavy shape



Type A:
Turn the bundle so that the deformed corner of the banknote is pointing towards the cassette end from which the banknotes are dispensed and not to the pressure carriage.



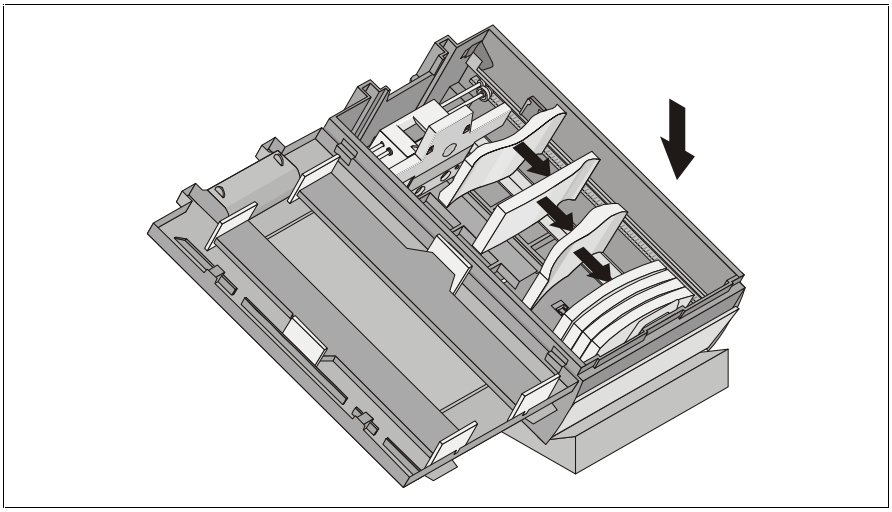
Type B:
Bundles whose S shape is pronounced and exceeds 5 mm should not be used. If no other banknote bundles are available, the entire bundle needs to be formed to a U shape as to be fit for use. Insert these bundles so that the deformed corners are pointing towards the cassette end from which the banknotes are dispensed and not towards the pressure carriage.



Type C:
If the bundle has a wavy shape as a result from having been tied, turn it so that the deformed corners are pointing towards the end from which the banknotes are dispensed and not towards the pressure carriage.

The following illustrations shows in which order the deformed banknotes have to be inserted.

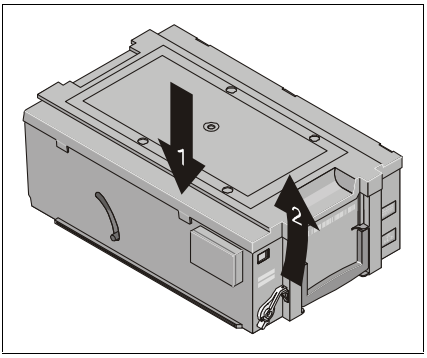
Note that the deformed corners of the banknotes must always point to the side from which the notes are dispensed. The bulging side must always point to the pressure carriage / cassette handle.



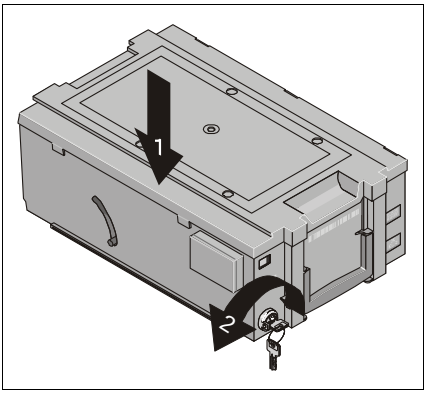
Inserting the cassette

The procedure for inserting cash-out cassettes and reject/retract cassettes is the same.

Closing the cassette



If the cassette does not have a lock, you must close the cassette lid (1) and turn the green locking lever (2) to the left. The cassette lid then engages in the lock, and the lever (2) automatically returns to its original position.



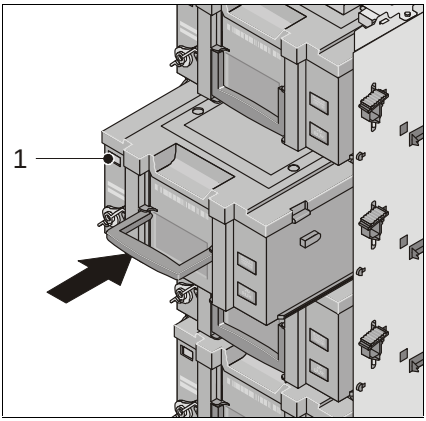
If the cassette has a lock, close the cassette lid (1) and turn the key (2) to the left as far as possible. Pull the key from the cassette lock.

Inserting the cassette

i Normally the tamper indicator (1) is 'green'. If the indicator is blue, the cassette has been tampered with or has been forced open (tamper indicator).

To switch the tamper indicator to green, proceed as follows:

- Unlock the cassette using the key or turn the locking/unlocking lever to the left. Open the lid (see section "Opening the cassette").
- Close the top cover of the cassette and turn the locking/unlocking lever to the left or lock the cassette with the key (see section "Closing the cassette").



Push the cassette back into the CMD-V4 in one uninterrupted motion until it audibly latches into place. Wait for the single beep confirming the correct pressure build-up in the cassette.

- If a triple signal tone sounds instead of a single tone, remove the cassette and check the contents of the cash-out cassette (see the instructions in the section "Filling the cash-out cassette"). Then try again to insert the cassette.

The acoustic warning (triple signal tone) is accompanied by a message on the status display of the controller (ZAC).

Example:

4

8 - Cash-out cassette 1

Cassette initialization

The initialization of the cassettes is necessary in case of new types of banknotes or cassettes. With the initialization the system will be informed about the cassette number, the currency and the denomination of the banknotes. If necessary, you can enter more parameters.

Please observe the product-specific and bank requirements concerning change of standard or individual changing of cassettes. Please obtain this information from the bank's administration.

Determining the reference value

The determination of the reference value can be performed for a maximum of 40 different unknown banknotes. It is controlled by the product-specific software.

The reference value determination is required for:

- Initial operation
- Use of new banknote types.

- Activate the product-specific software (see chapter "Basic Operation", section "Calling the product-specific software" in the operating manual of the basic device).

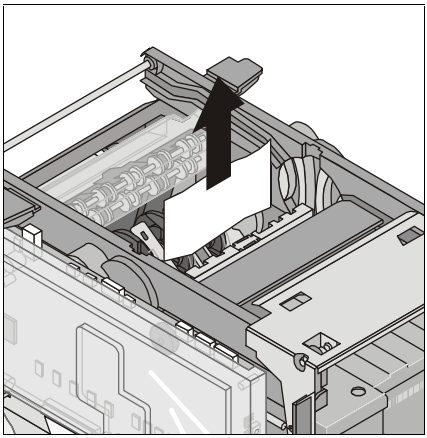
From the specified cassette the currency characteristics, the value of the banknotes and the emission date will be read out. These values are transmitted to the cassette when it is initialized. There will be as many banknotes dispensed as necessary to determine the reference value. The process of determining the reference value will be terminated at the latest if the reference value cannot be determined within the maximum possible number of banknotes. In this case, the cassette's status remains <P>.
After the reference value has been determined, the dispensed number of banknotes is reported back to the system.
If no reference value has been determined, the status <P> is reported back to the system. Dispensing is impossible from this cassette in this case.

The dispensed banknotes are located in the stacking position in the clamp.

- Open the safe door (see the operating manual of the basic device).

- Holding the green release lever, pull out the CMD-V4 as far as possible (see chapter "Removal/Installation of Components", section "Pulling out / pushing in the CMD-V4").

i If the release lever jams and you cannot pull out the CMD-V4, you should always see the chapter "Troubleshooting".



Remove the dispensed banknotes from the clamp stacking position and count them.

The number of dispensed banknotes must be the same as the one indicated by the system. If this is not the case, you will have to repeat the whole procedure for determining the reference values.

Place the counted banknotes back in the clamp stacking position.

- Push the CMD-V4 as far as possible into the safe.
- Wait until the CMD-V4 is ready.
- After the CMD-V4 has powered up, the cash in the stacking position is transported to the reject / retract cassette.
- Select the next cash-out cassette using the product-specific software or quit the function for setting the reference value.
- Close the safe door (see the operating manual of the basic device).

Function test

In some cases it is useful to check whether the CMD-V4 is ready for operation without using other tools.

There is a function button on the controller for this purpose. Pressing this button lets you cycle through the possible functions on the status display. Releasing the button when the required function is shown will trigger the function.

The functions described in the following sections can be performed only when the safety switch is closed (i.e. the CMD-V4 is in cash-out position). Functions ’2’ and ’3’ may be started only from normal operation (display ’00’ or ’14’) or when all transport paths are guaranteed to be clear.

Display	Function	Function description
00	Normal operation	Return to normal mode (no function)
01	RESET	After resetting, the result is shown on the status display.
02	Overall test + RESET	All mechanical CMD-V4 components are operated one after the other.
03	Test dispensing + RESET	Standard command set: A note is dispensed from each installed cassette and transported to the reject/retract cassette. <nACT> is modified; <nNDV> remains unchanged.

4	FW version	The version number is displayed in alternating mode. Example: From the firmware identifier (read with DIL) **MOD 061203 1137 CMD_V4_0.BIN** the version number **1137** is displayed as follows: **11** for 1 second **37** for 1 second dark for 1 second **After nine attempts, the device returns to normal mode.**
5	Reset statistics counter	Resettable counters are set to 0, and the current time of the realtime clock is saved.

Start-up

Initial start-up

The following tasks have to be performed in the specified order for initial start-up of the cash media dispenser (CMD-V4):

1. Adjusting the cash cassettes to the note size unless the production plant has done so in advance
2. Filling the cassettes with genuine cash and pushing them in
3. Updating the note parameters and cassette fill level data
4. Calculating reference values for the various note types
5. Testing with genuine cash

The "Device Overview and Operation" chapter describes how to carry out these steps.

Starting up after component replacement

The following steps are necessary if you have replaced components in the CMD-V4:

1. Initialize the CMD-V4
2. Adjust the cassettes to the note size unless the production plant has already done so (if applicable after replacement)
3. Fill the cassettes with genuine cash and push them in (if applicable after replacement)
4. Update the note parameters and the cassette fill level data (if applicable after replacement)
5. Calculate reference values for the various note types (if applicable after replacement)
6. Test with genuine cash

The "Device Overview and Operation" chapter describes how to carry out these steps.

Electronic adjustments for the CMD-V4

	Photosensor initialization *	Pressure sensor initialization **	Calculation of reference values ***	Cassette initialization ****
Installation			X	X
Maintenance			X	
Stacker replaced	X			
CMD controller replaced	X	X	X	
Dispensing unit and thickness measuring station replaced	X	X	X	
Dispensing unit without thickness measuring station replaced	X	X		
Cash-out cassette replaced				X
New note type used			X	X
New firmware loaded				
Shutter	X			

* Initialize the photosensors with cassettes removed; the photosensors must not be covered (KDIAG: DXM)

** Remove the cassette with the CMD-V4 switched on (running but dispensing not active) and reinsert it.

*** Calculate reference values with initialized/inserted cassettes using genuine cash (KDIAG menu: 'Applications', 'Init. CMD-V4')

**** Initialize the cassettes (KDIAG menu: 'Applications', 'Init.CMD-V4')

Initializing the CMD-V4

The CMD-V4 stores many parameters in a battery-backed CMOS RAM.

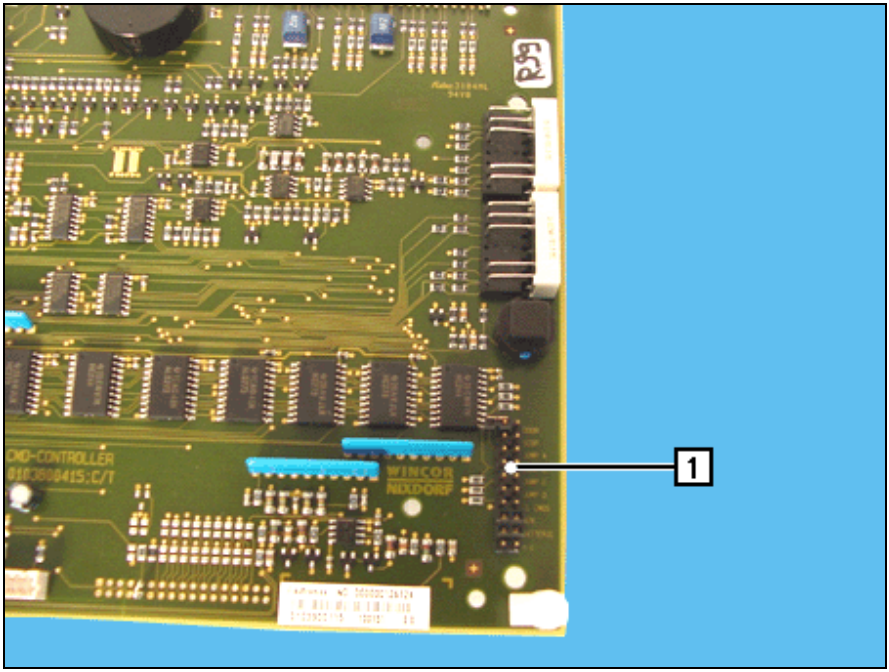
i This parameter area must be initialized when components have been replaced (CMD controller, SAT, dispensing units or shutter).

The parameters are initialized as follows:

- Remove all cassettes.
- Make sure that there are no notes in the transport paths (all photosensors must be free).
- Check the jumper settings on the CMD controller in accordance with the system configuration.
- All connectors must have been inserted on the CMD controller.
- Before switching on the device, set jumper 7 (Clear CMOS) on the CMD controller. Switch the CMD-V4 on. Jumper 7 remains inserted until the value 'io' appears on the status display.
- Remove jumper 7 (Clear CMOS) and wait until '14' appears on the status display during the start-up phase. Carry out a reset if nothing is displayed.
- Now push the cassettes in.
- Register the cassettes with the aid of the product-specific software and calculate reference values (see the "Device Overview and Operation" chapter).

Jumper settings on the CMD controller

Position of the jumper array on the CMD controller



1 Jumper array on the CMD controller

The 10-position jumper array beneath the status display controls the following settings:

Jumper	Signal	Open	Closed
1	Door	Ignore door sensor when encryption is used	Do not ignore door sensor when encryption is used
2	SCOP	Deactivate SCOP handling	Activate SCOP handling
3	Jump A	Set standard line parameter (19200,8,2,ODD); trigger reset (remove the jumper afterwards)	
4	Jump B	Two double dispensing units in a 4-cassette housing	One double dispensing unit in a 4-cassette housing
5	Jump C	Reserved for future use	
6	Jump D	NCR Emulation is active	
7	Clear CMOS	Clear CMOS; trigger reset (remove the jumper afterwards)	
8	NEN	SE controls power saving mode	NEN signal is generated by the CMD-V4
9	Battery	CMOS backup battery inactive	CMOS backup battery active
10	Jump PLD	Spare input for the programmable logic device	

Jumper 1 is located at the top of the controller board.

Door / SCOP should only ever be selected with one jumper.

If this is not done (both jumpers are inserted) standard encryption is overlaid by SCOP handling!

i The dispensing amount is part of the SCOP procedure. There is therefore an automatic switch to the controller's standard instruction set when the procedure is activated.

Default settings

Jumper inserted

NEN

Battery

Jumper inserted on one side (on one pin only)

DOOR (possibility of activating DOOR or SCOP)

Adjusting cash cassettes to the note size

For more details, read the "Setting the banknote width" and "Setting the banknote height" sections in the "Device Overview and Operation" chapter.

Filling the cassettes with genuine cash and pushing them in

When the device has been switched on and no errors have occurred, the cash-out cassettes have to be filled with genuine cash. For more details, read the "Filling the cash-out cassette" section in the "Device Overview and Operation" chapter.

Updating the note parameters and cassette fill level data

You can find information on this in the "Cassette initialization" section of the "Device Overview and Operation" chapter.

Calculating reference values for the various note types

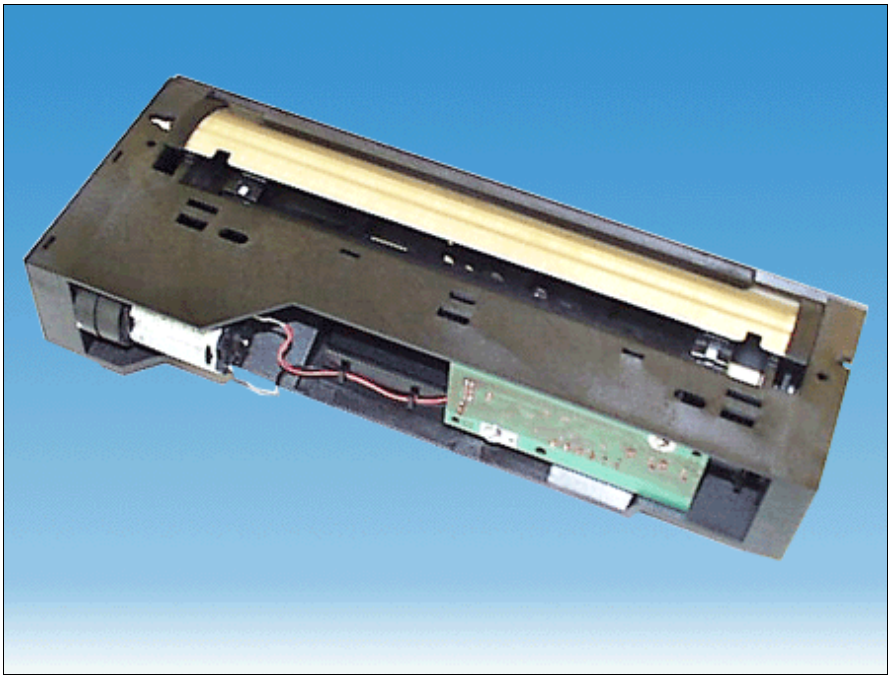
You can find a description of this in the "Calculating reference values" section of the "Device Overview and Operation" chapter.

Testing with genuine cash

For more details, read the "Function test" section in the "Device Overview and Operation" chapter.

CMD V4 Shutter 01750053690 / -56960

Shutter CMD V4 horizontal RL	01750053690
Shutter CMD V4 horizontal FL	01750056960



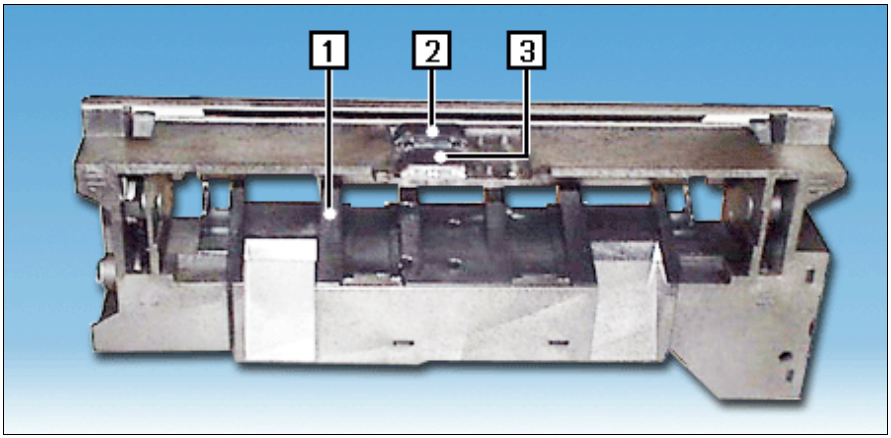
Structure

The shutter locks the cash output tray of the cash media dispenser (CMD-V4). It includes the following assemblies:

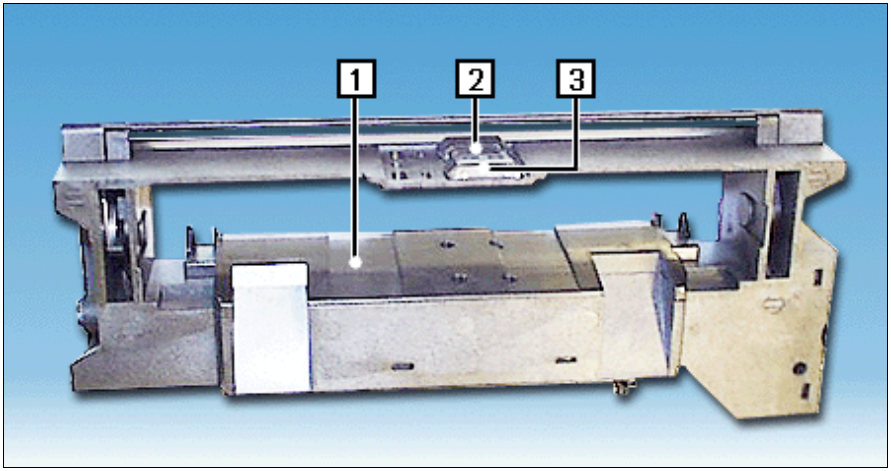
- Shutter
- Drive mechanism with DC current motor, gear and locking mechanism
- 1 photosensor for providing a cash bundle for output
- 1 photosensor for monitoring removal of cash
- Interface board with the two hybrid photosensors for controlling the shutter

The two versions (frontload and rearload) only differ in the so-called ramp in the cash path and in the position of photosensors PS 27 and PS 28.

Rear view of rearload version

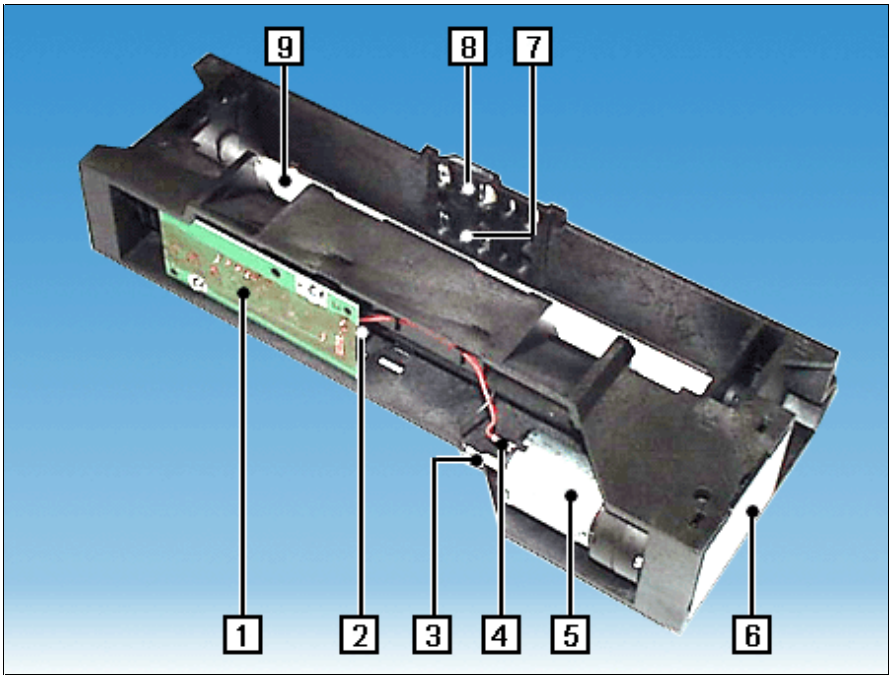


Rear view of frontload version

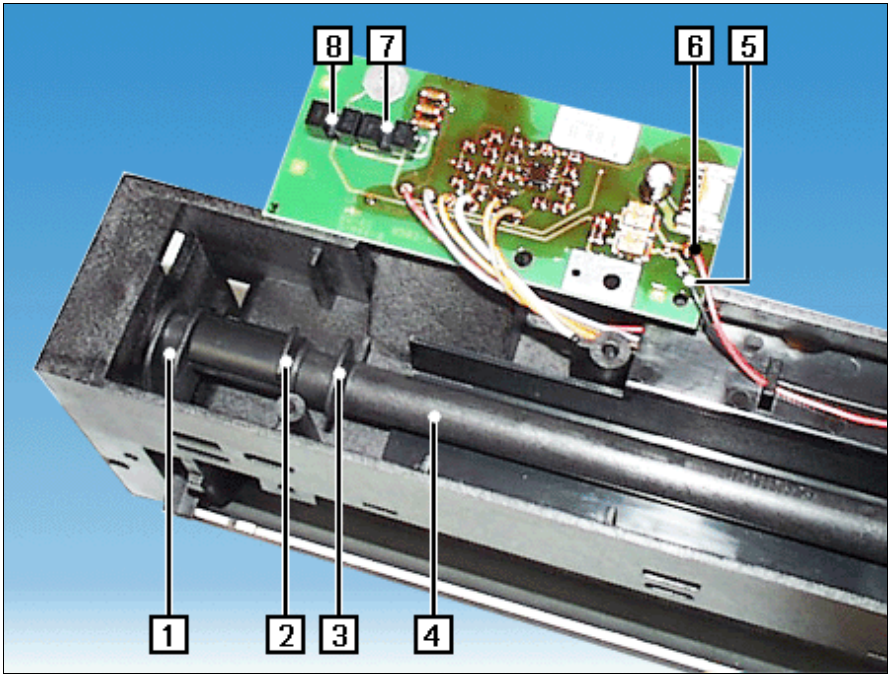


1 Ramp
2 Prism for photosensor PS 27
3 Prism for photosensor PS 28

The rest of the shutter's structure is shown using the rearload version by way of example. The structure of the shutter in the frontload version is basically the same.



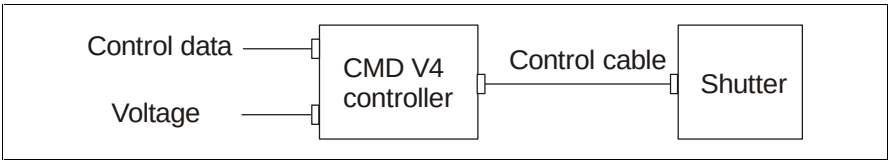
1 Electronic board
2 Connector
3 Motor connection (-)
4 Motor connection (+)
5 DC current motor
6 Gear cover
7 Prism for photosensor PS 27
8 Prism for photosensor PS 28
9 Shutter



1 Moving and locking mechanism (left)
2 Switching flap for DPS 11
3 Switching flap for DPS 10
4 Drive shaft for shutter
5 Motor connection (-)
6 Motor connection (+)
7 Hybrid photosensor DPS 10
8 Hybrid photosensor DPS 11

Function

The shutter is controlled via the firmware of the CMD-V4 controller and is initiated by the application software.



The firmware evaluates the signals from photosensors PS 27 and PS 28 as well as from hybrid sensors DPS 10 and DPS 11, and controls the motor.

Photosensor	**Function**
PS 27	Monitoring removal of cash
PS 28	Stop position of the cash output gripper
DPS 10 / DPS 11	Position of the shutter's drive shaft

i The names for the photosensor and the electronic signal vary (see the table in section "Pin assignment").

The motor-driven shaft has a driving cam on the left and on the right side. - They are constructed in such a way that the shutter is locked by the catches on the shutter bearings when the shutter is closed.

Shutter and drive mechanism are not directly connected.

When the driving cams turn, the shutter is forced open.

The shutter closes when the driving cams are turned backwards by the driving shaft. However, the shutter follows this movement only by spring force.

The shutter can only be locked when it is completely closed.

This construction excludes the risk of injury for the user.

Cash removal

If the application sends an order to dispense cash, the shutter is first opened completely via the firmware. After the banknotes have been transported into the position where they can be removed, the shutter is partly closed depending on the thickness of the banknote bundle. The thickness of the bundle is detected by the thickness measuring unit in the CMD-V4. The value that is identified is used to control the drive motor for a limited time.

When the cash has been removed the shutter is first opened completely via the firmware and the drive belts in the transport clamp are briefly moved backward. Then the shutter is closed completely and locked unless this is prevented by external influences.

Error code 28

If the shutter does not close within approx. 1 second, the firmware turns the motor off, generates an error code (error code 28 displayed on the CMD-V4 controller) and reports the error to the application.

Error code 29 (protection against tampering)

Error code 29 is displayed if photosensor PS 27 is covered when the shutter is closed. The firmware tries to close the shutter anyway. The motor is turned off if that does not succeed within approx. 1 second.

Meaning of hybrid photosensors

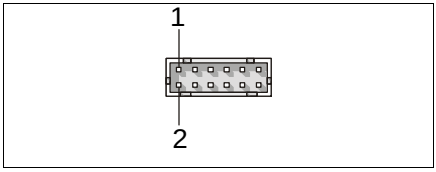
DPS 10	DPS 11	Meaning
open	Covered	Shutter is completely open (OPEN position)
Covered	Covered	Shutter is open (position between OPEN and CASH REMOVAL)
Covered	open	Shutter is in the locking phase.
open	open	Shutter is closed and locked (CLOSED position)

Signal level at the connector:

Open = 1 (H) = + 12 V

Covered = 0 (L) = 0 V

Pin assignment



Type of connector:
JST PHD 12M

Pin	Name	Comment
1		not connected
2		not connected
3	+ 12 V	
4	GND	
5	Motor (+)	Motor connection (+)
6	Motor (-)	Motor connection (-)
7	DPS 10	
8	DPS 11	
9	PS 27	
10	PS 28	
11	Transmitting current PS 27 and PS 28	
12		not connected

Firmware name	Electronic signal
PS 27	LS 26
PS 28	LS 29

Maintenance

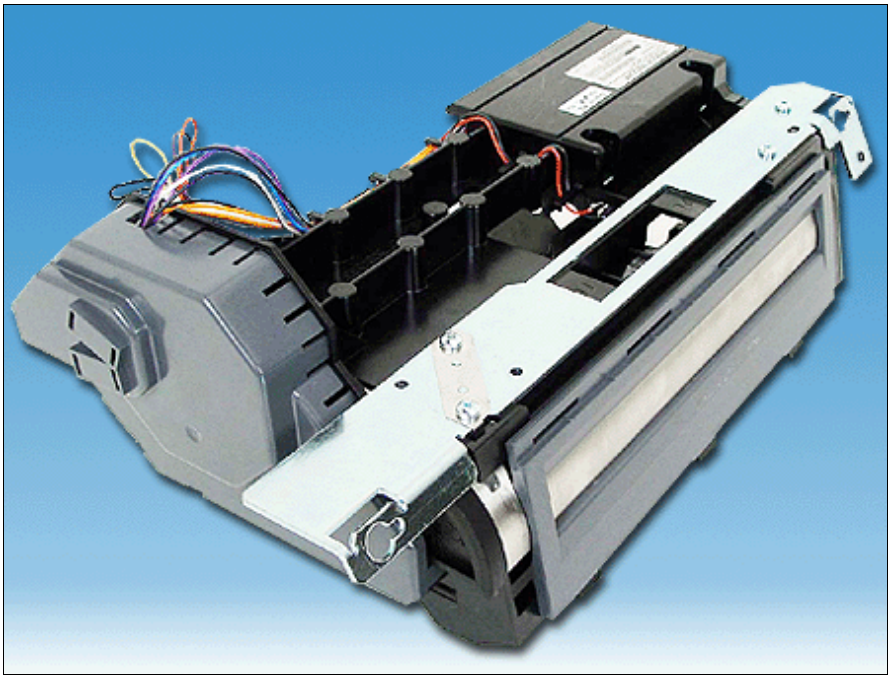
The shutter does not require maintenance under normal operating conditions.

Technical data

Dimension:		
Height:	128	mm
Width:	304	mm
Depth:	67	mm
Weight:	820	g

CMD V4 Shutter 01750045330 / -54768

Shutter CMD V4 vertical RL	01750045330
Shutter CMD V4 vertical FL	01750054768



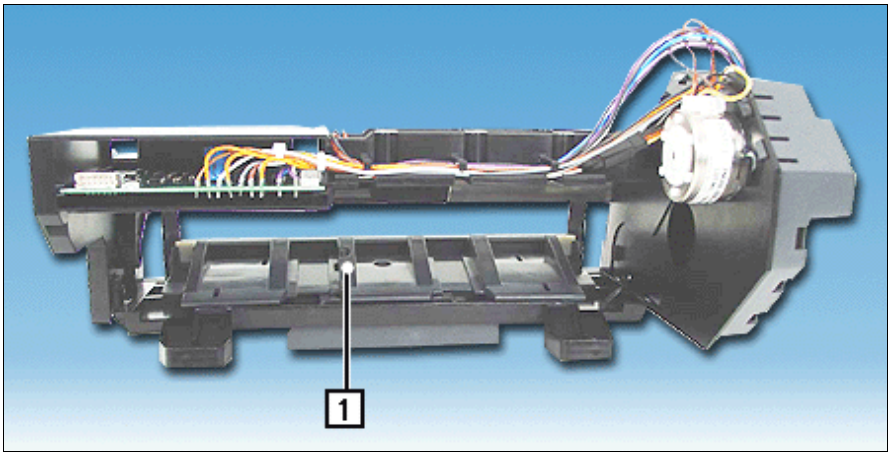
Structure

The shutter locks the cash output tray of the cash media dispenser (CMD-V4). It includes the following assemblies:

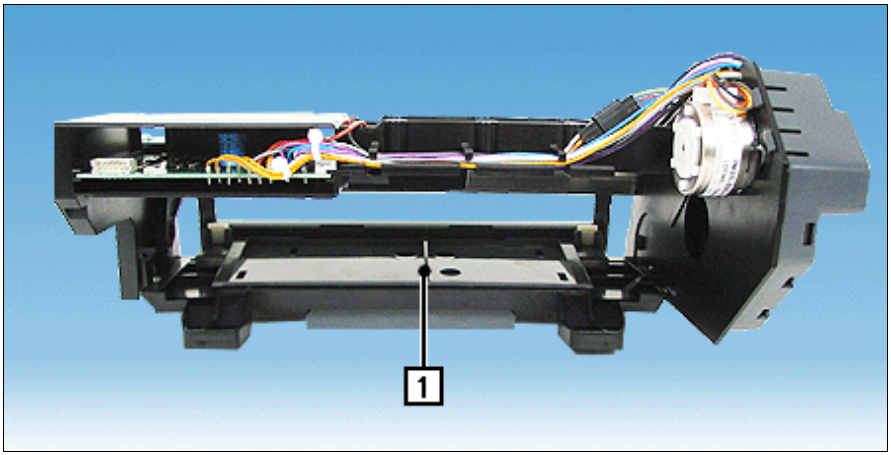
- Shutter
- Drive mechanism with stepper motor, gears, locking mechanism, and two hybrid photosensors (DPS 10 and DPS 11) for monitoring the position of the shutter
- 1 photosensor (PS 28) for providing a cash bundle for output
- 1 photosensor (PS 27) for monitoring removal of cash
- Interface board for controlling the shutter

The two versions (frontload and rearload) only differ in the so-called ramp in the cash path and in the position of photosensors PS 27 and PS 28.

Rear view of rearload version

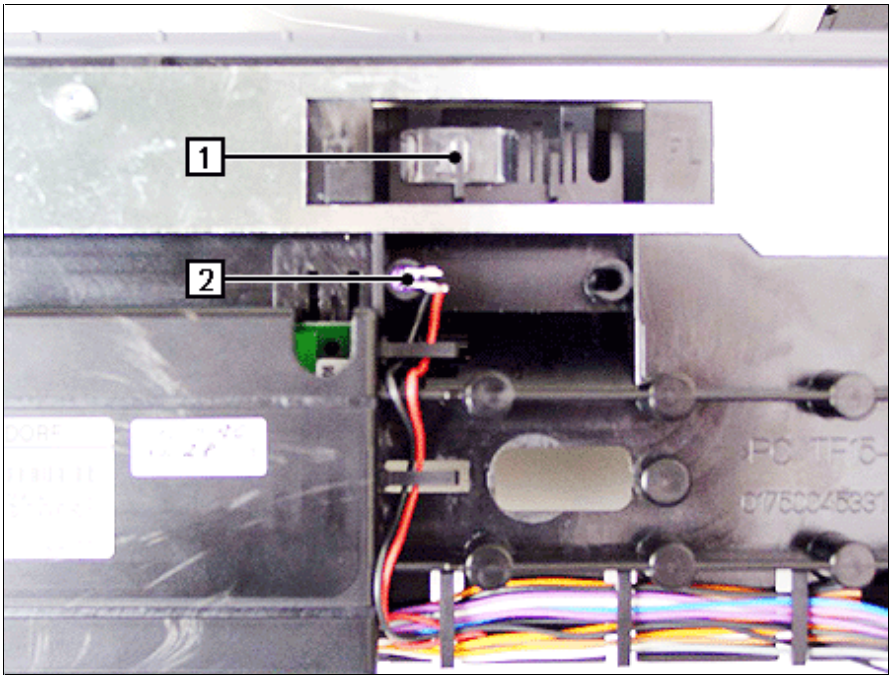


Rear view of frontload version



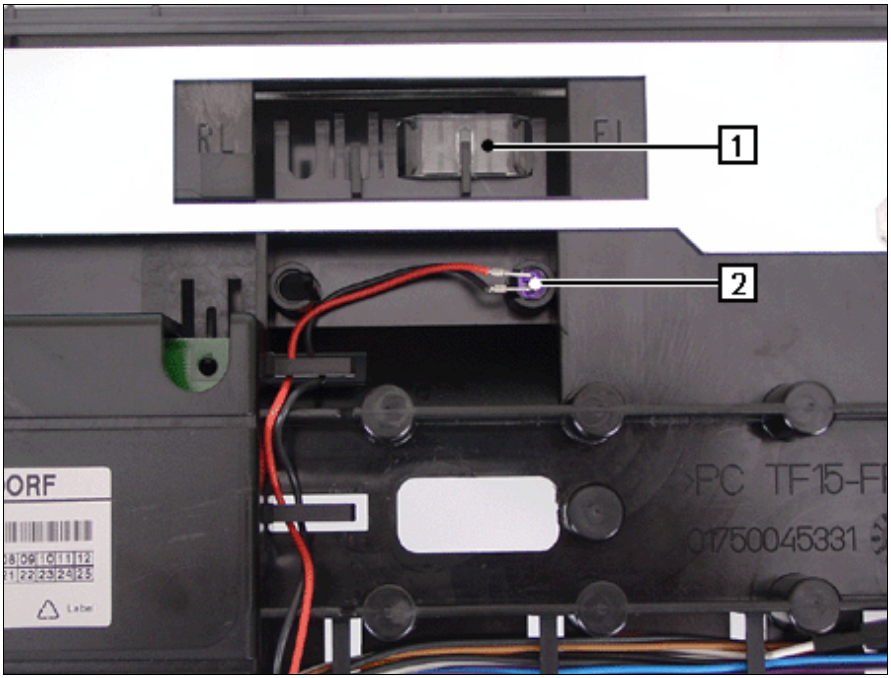
1 Ramp

Position of photosensors in the rearload version



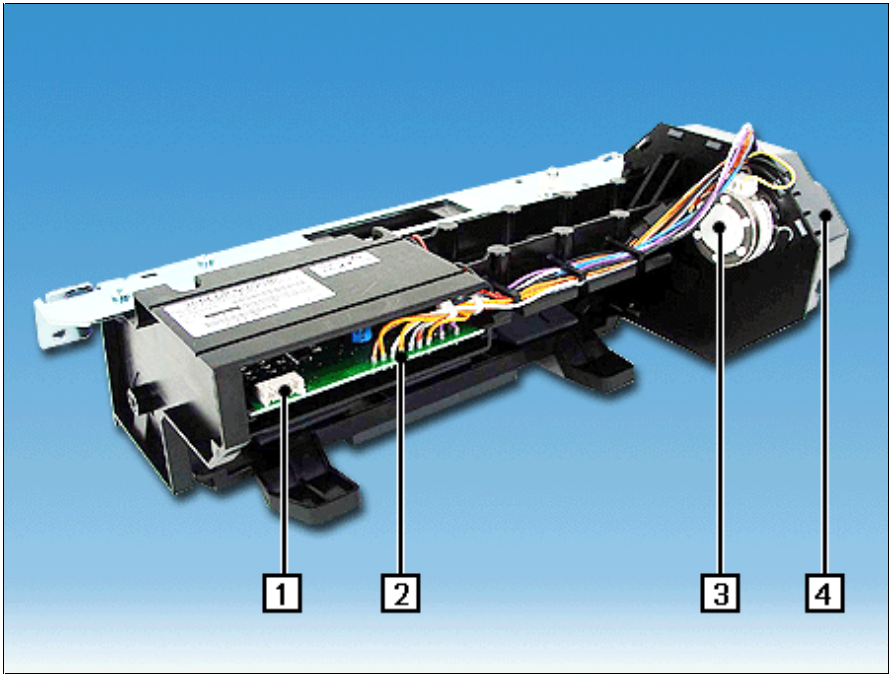
1 Prism for photosensor PS 27 2 Photosensor PS 28

Position of photosensors frontload version

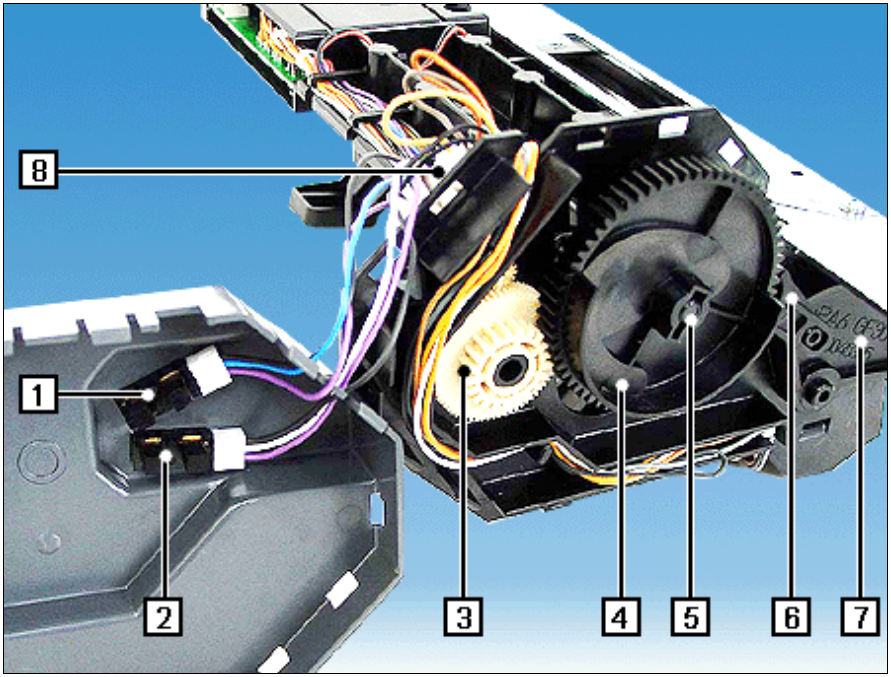


1 Prism for photosensor PS 27 2 Photosensor PS 28

i The rest of the shutter's structure is shown using the rearload version by way of example. The structure of the shutter in the frontload version is basically the same.



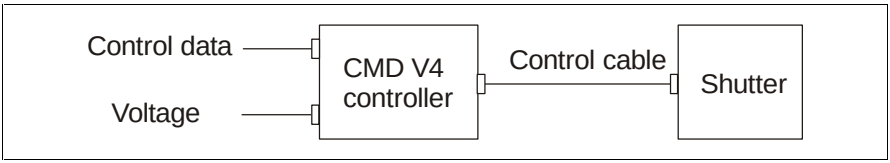
1 Connector
2 Electronic board
3 Stepper motor
4 Cover for gears



1 Hybrid photosensor DPS 11
2 Hybrid photosensor DPS 10
3 Double toothed wheel
4 Switching flap for DPS 11 and DPS 10 at cam disk
5 Cam
6 Lever
7 Shutter side piece
8 Stepper motor

Function

The shutter is controlled via the firmware of the CMD-V4 controller and is initiated by the application software.



The firmware evaluates the signals from photosensors PS 27 and PS 28 as well as from hybrid sensors DPS 10 and DPS 11, and controls the motor.

Photosensor	**Function**
PS 27	Monitoring removal of cash
PS 28	Stop position of the cash output gripper
DPS 10 / DPS 11	Position of the shutter's drive shaft

The names for the photosensor and the electronic signal vary (see the table in section "Pin assignment").

Shutter and drive mechanism are directly connected. The rotation of a cam disk makes the shutter open and close. The stepper motor has low motive force so there is no risk of injury when the shutter is closed.

The shutter is locked automatically when it is completely closed.

Cash removal

If the application sends an order to dispense cash, the shutter is first opened completely via the firmware. After the banknotes have been transported into the position where they can be removed, the shutter is partly closed depending on the thickness of the banknote bundle. The thickness of the bundle is detected by the thickness measuring unit in the CMD-V4. The value that is identified is used to control the drive motor for a limited time.

When the cash has been removed the shutter is first opened completely via the firmware and the drive belts in the transport clamp are briefly moved backward. Then the shutter is closed completely and locked unless this is prevented by external influences.

Error code 28

If the shutter does not close within approx. 1 second, the firmware turns the motor off, generates an error code (error code 28 displayed on the CMD-V4 controller) and reports the error to the application.

Error code 29 (protection against tampering)

Error code 29 is displayed if photosensor PS 27 is covered when the shutter is closed. The firmware tries to close the shutter anyway. The motor is turned off if that does not succeed within approx. 1 second.

Meaning of hybrid photosensors

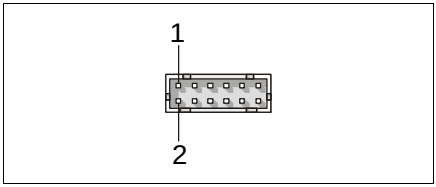
DPS 10	DPS 11	Meaning
open	Covered	Shutter is completely open (OPEN position)
Covered	Covered	Shutter is open (position between OPEN and CASH REMOVAL)
Covered	open	Shutter is in the locking phase. The follow-up time incorporated in the firmware ensures that the shutter is closed completely and locked (CLOSED position).

Signal level at the connector:

Open = 1 (H) = + 12 V

Covered = 0 (L) = 0 V

Pin assignment



Type of connector:
JST PHD 12M

Pin	Name	Comment
1	+ 24 V	
2	GND	Load for + 24 V
3	+ 12 V	
4	GND	
5	Motor (+)	Stepper motor On / Off *1)
6	Motor (-)	Direction of rotation of the stepper motor– forward / backward *1)
7	DPS 10	
8	DPS 11	
9	PS 27	
10	PS 28	
11	Transmitting current PS 27 and PS 28	
12		not connected

*1) These two signals from the CMD-V4 controller are converted by a clock generator on the shutter's controller card into clock signals for the stepper motor.

Firmware name	Electronic signal
PS 27	LS 27
PS 28	LS 28

Maintenance

The shutter does not require maintenance under normal operating conditions.

Technical data

Dimension:			
	Height:	127	mm
	Width:	337	mm
	Depth:	185	mm
Weight:		1020	g

Troubleshooting

Operating or troubleshooting tips are output on the two-character status display on the controller. In normal operation this display is set to 00 at the beginning of every reset, transport or dispensing operation. If a special state occurs during one of these operations, this is shown on the status display and is retained until the next device operation.

Additional messages may be displayed during initialization, after powering up and after a reset.

It is also possible to run an internal test to see if the CMD-V4 is ready for operation. You can find more on this in the "Function test" section of the "Device Overview and Operation" chapter.

To perform a reset after troubleshooting, move the clamp to its basic position (stacking position of the clamp in the stacker).

Displays at startup

No.	Meaning	Reaction
OFF	No power supply	Switch on the device.
.8 .8	Controller faulty	Replace the controller.
0 to 9	Controller test after Power On (displays are flashing and keep changing)	None
b E	Warning: Battery too weak	Replace battery (controller)
1 0	Controller faulty	Replace the controller.
- -	Startup of firmware (reset) Validation of firmware Check of CMOS parameters Test of mechanical components Clearing run	None -> Error 11 -> Initialization of photosensors -> CMOS error PS xx, 22 -> Error 23 ... 28 -> Error 18,19, 71..9A
P X S X	Error during photosensor initialization after change of configuration or replacement of controller (the display alternates between 'PS' and the photosensor number 'XX').	Check and clear photosensor xx, try RESET again. Replace module or controller if necessary.
0 0	Power-up completed without errors.	

Displays in normal operation

Error code	Meaning	Explanation / Measures
OFF	No power supply	Switch on the device.
-	Start-up (after RESET or electronics self-test)	Wait until power up is completed.
bu	Burn; program controller	
co	Compare; check controller	
io	Controller OK	
00	No error	-
01	Faulty software	Switch the device off and on again. Read the hardware status (stop info field) and download if necessary.
05	Communication problem with ChipCard controller	Check the lines to the ChipCard controller. Check the ChipCard controller and replace it if necessary.
06	Communication problem with ChipCard / or wrong ChipCard inserted (ChipCard number not '226-0PR').	Check the ChipCard at the controller and replace it if necessary.
08	Stacker EEPROM missing/defective	Check the lines to the EEPROM / replace the EEPROM

Error code	Meaning	Explanation / Measures
09	Locking switch open, the CMD is not in the dispensing position	Grasp the green locking handle and push the CMD-V4 into the device as far as it will go (the CMD-V4 must audibly latch into place). If this is impossible, it is necessary to check the locking switch and adjust or replace it as applicable.
10	Controller defective or battery jumper not inserted	Insert the battery jumper. When starting the CMD-V4, the power-up test detected a serious fault in the electronics of the controller. The controller must be replaced.
11	Software missing (download)	Reload firmware.
12	Safety switch open	Push in the CMD-V4.
13	Blocking of device pending	A retract has been executed. The cash that was not removed by the customer has been placed in the SAT. After this, all transport functions of the CMD-V4 are disabled by the software. Remove the customer money from the SAT, and then reset the device lock using the product-specific software (reset lock flag).

Error code	Meaning	Explanation / Measures
81 84	CMD-V4 minimum configuration is missing	Cassette is defective or missing. In order to be able to operate, the CMD-V4 requires at least one cash-out cassette ready for operation and the reject/retract cassette. Insert the reject/retract cassette and the filled cash-out cassette(s), and register them using the product-specific software.
81 87	Belt drive of clamp defective (M 3) or jam	Replace the output transport or the controller.

Error code	Meaning	Explanation / Measures
18	Cash jam during dispensing	A banknote jam was detected during dispensing in the dispensing areas or the vertical transport facilities of the dispenser units or the stacker (photosensors PSDx, DDU, PS1, PS18). Check the cash path from the cassettes to the collecting tray or reject compartment for jammed notes. Verify that the connectors on the CMD controller or at the photosensor elements are plugged in properly. Then return the CMD-V4 to cash-out position in the safe, thereby closing the safety switch and starting the CMD-V4 again (Reset). If the status display continues to show '18' after this start, the jam was not completely eliminated or another jam occurred. Using a test program check the self-test job 'Status of the Photosensors'. If a photosensor (other than the 'cassette empty' photosensors) is reported 'covered', determine the cause and eliminate the fault. If you cannot find a fault and '18' still appears after the next restart, the SAT, the relevant dispensing unit or the controller have to be replaced.

Error code	Meaning	Explanation / Measures
19	Clamp transport defective / blocked	Eliminate the blockage and then reset. If necessary, replace stacker or controller.
20	Single reject switch (MA2/1, MA2/2, SM 1) faulty / blocked	Check the SAT in the area of the single reject switch for jammed notes / scraps and remove them. Check the movement of the single reject switch by pressing and releasing the anchor in lifting magnet MA2. Select test function 2 (mechanical test) by pressing the function button, and observe actuation of the single reject switch. If lifting magnet MA2 does not move at all or all the way, the stacker and output transport (SAT) or the controller has to be replaced. If the magnet moves all the way, the CMD-V4 can go back into operation. If the fault recurs within a short time and checking the single reject switch fails to reveal the cause, the SAT or the controller has to be replaced.
21	Measuring station is defective (DDU)	Check whether there is a banknote jam in the area of the measuring station. Are the cables connected? Replace dispensing unit with DDU or controller.

Error code	Meaning	Explanation / Measures
22	Photosensor amplifier is faulty or photosensor initialization is unsuccessful	Check all cash paths from the cassettes to the stacking compartment, from the stacking compartment to the cash-out and the inlet area of the reject/retract cassette for jammed notes and scraps and remove them. Then return the CMD-V4 to cash-out position in the safe, thereby closing the safety switch and starting the CMD-V4 again (Reset). If the status display continues to show '22' after restart, the controller must be replaced.
23	Routing disk (SM2/SM3) faulty / blocked	Eliminate the blockage. Set the CMD-V4 in the safe to cash-out position (safety switch closed) and select test function 2 (mechanical test) on the function button after starting up. If this test function once again ends with status display '23', the SAT or the controller must be replaced, otherwise the CMD-V4 cannot be operated.

Error	Meaning	Explanation / Measures

code		
24	Reject/retract drive (MA6) defective / blocked	The choice of reject/retract compartment in the RR cassette could not be set properly. Remove the RR cassette and check the movement of the retract compartment. Check whether the connector on the CMD controller and lifting magnet MA6 has been plugged in correctly. Check whether the digital photosensor is firmly attached to the switchover lever. Place the CMD-V4 in the safe in its dispensing position (safety switch closed). Reinsert the RR cassette, select test function 2 (mechanical test) by pressing the function button, and check the movement of the RR drive (MA6). If the lifting magnet does not move or if the end positions of the lever are not reached (24 appears again on the status display), the output transport or the controller has to be replaced.

Error	Meaning	Explanation / Measures

code		
25	Dispensing drive (DCM 1) defect / blocked	It was not possible to bring the main motor (DCM 1) up to minimum speed after a short start-up period. Select '1' (Reset) on the function button. If the motor tries to start, but there is a loud running noise: check the cash paths of the CMD-V4 for a massive note jam. Check the inlet to the reject/retract cassette for jammed notes. Set the CMD-V4 in the safe to cash-out position (safety switch closed) and select test function 2 (mechanical test) on the function button after starting up the CMD-V4: check the running noise and transport function of the main motor. If the main motor does not rotate or if this test function once again ends with status display '25', the output transport or the controller must be replaced, otherwise the CMD-V4 cannot be operated.

Error	Meaning	Explanation / Measures

code		
26	Stacker wheel drive (SM 9) defect / blocked	Check the SAT in the area of the collecting tray for jammed notes / scraps and remove them. Set the CMD-V4 in the safe to cash-out position (safety switch closed) and select test function 2 (mechanical test) on the function button after starting up the CMD-V4: if this test function once again ends with status display '26', the SAT or the controller must be replaced.
28	Shutter error	Check the output area of the CMD-V4 and of the shutter for any foreign matter that may be preventing the shutter shield from moving. Place CMD-V4 in cash-out position (safety switch closed). Select test function 2 (mechanical test) by pressing the function button, and observe the movement of the shutter. The shutter fault can also be remedied without danger while the test function is in progress. Then run through test function 2 again without interfering with the movement of the shutter. If this test function once again ends with status display '28', the shutter or the controller must be replaced.

Error code	Meaning	Explanation / Measures

29	Cash-out photosensor covered (manipulation)	Check the SAT banknote output and shutter for any foreign bodies that may be disturbing the functioning of the output photosensor. Verify that the connectors at the CMD-V4 are properly plugged in. Set the CMD-V4 in the safe to cash-out position (safety switch closed) and select test function 1 (Reset) on the function button. If status code '29' reappears after the CMD-V4 is started, the shutter, the SAT or the controller must be replaced.

Error	**Meaning**	**Explanation / Measures**

code		
3 X	Too many problems during dispensing from cassette x (x = 1 – 6)	Bundle rejects can be caused by extremely skewed banknotes or banknotes that are extracted in an uncontrolled way or by problems with the photosensors. This error can be ignored the first time it occurs (warning), but do the following if it recurs often: 1. Remove the cassette from dispensing unit x and check the inserted banknotes: are the front notes deformed on one side? Is pressure applied evenly to the front banknotes (left and right)? 2. When the cassette is removed, check the dispensing area in the dispensing unit for jammed scraps. 3. Check the cash path from the cassette 'x' to the collecting tray for jammed notes / scraps. Has a transport belt come off the rollers? 4. Verify that the connectors on the CMD controller and at each photosensor elements are plugged in properly.

Error	Meaning	Explanation / Measures

code		
3 X	Too many problems during dispensing from cassette x (x = 1 – 6)	5. Check whether the magnet for the retaining shaft moves stiffly. Do this by pressing its anchor. (If necessary check the movement of the magnet with test function '2' – mechanical test). If you cannot find a fault and '3x' still appears, the relevant dispensing unit or the controller have to be replaced.
4 X	Cash could not be dispensed or faulty amount of pressure against the banknotes when a cassette is inserted (x = 1 - 6)	A) No cash could be dispensed from cassette 'x' or B) The required pressure could not be established when the cassette was inserted. Procedure in case A): 1. Remove the cassette 'x' and check the inserted banknotes: the notes must be standing upright in the cassette. Are the first notes very crumpled? Curved notes should bend away from the pressure carriage! Are the first notes stuck to each other or jammed together? 2. When the cassette is removed, check the dispensing area in the dispensing unit for jammed notes/scraps.

Error code	Meaning	Explanation / Measures

4 X	Cash could not be dispensed or faulty amount of pressure against the banknotes when a new cassette is inserted (x = 1 - 6)	3. Verify that the connectors on the CMD controller and at the plug connection of dispensing unit 'x' are plugged in properly. 4. Then insert the filled cassette into dispensing unit 'x' and select function '3' on the function button (test dispensing) with the safety switch closed. If this test ends with error code '4x' again, repeat the test dispensing procedure checking the function of the clutch and retaining shaft in the process. If the clutch or retaining magnet is not activated, the dispensing unit or controller must be replaced. Procedure in case B): 1. Remove the cassette 'x' and check the inserted banknotes: the notes must be standing upright in the cassette. Are the first notes very crumpled? Curved notes should bend away from the pressure carriage! If necessary, transfer notes from the back of the cassette to the front. If the stack of banknotes rubs excessively against the banknote guides on the side (notes protrude on the side or are bent backwards), the stack of notes should be better aligned.

Error	**Meaning**	**Explanation / Measures**

code		
4 X	Cash could not be dispensed or faulty amount of pressure against the banknotes when a new cassette is inserted (x = 1 - 6)	2.) Re-insert the cassette. Can you hear the pressure carriage moving forward? - If there is no noise, verify that the connectors on the CMD controller and the cassette are plugged in properly. Perform a test using a different cassette. If the motor is still not activated, the controller is faulty. - If you can hear the motor running, but error message '4x' still appears after a few seconds (together with three acoustic signals), remove the cassette and check manually if the dispensing shaft can be lifted easily. Remove the cassette, open it and place it in dispensing position manually. Check the smooth movement of the return bar.

Error	Meaning	Explanation / Measures

code		
4 X	Cash could not be dispensed or faulty amount of pressure against the banknotes when a new cassette is inserted (x = 1 - 6)	3.) If you cannot find the cause of the problem and if the same problem occurs in this dispensing unit with a different cassette, the quality of the pressure sensor needs to be checked using the DYQ self-test program 'Check status of cassette pressure'. If an error occurs, the dispensing unit or controller must be replaced.
5 X	Too many poor quality notes (x=1-6)	Too many double or excessively wide/narrow notes were detected during dispensing from cassette x. Remove cassette x, and check whether the right type of banknote was inserted. Check notes for deformations or sticky points. Reinsert the cassette and restart the application. If many 'good' notes are subject to a single reject during dispensing or if error '4x' recurs after a short time, the reference values should be recalculated for this note type. If the error cannot be removed, the dispensing unit or controller must be replaced.

Error	Meaning	Explanation / Measures

code		
6 X	Cassette defective (x = 1 - 6)	The banknote data stored in cassette 'x' cannot be read or re-written. Verify that the connectors on CMD controller and the cassette connector are plugged in properly. If the fault also occurs with a different cassette in this dispensing unit, the controller must be replaced.

Dirty photosensors / sensors

Error code	Meaning	Explanation / Measures
30	Banknote thickness measuring station (DDU) not ready	Check whether there is a banknote jam in the area of the measuring station. Are the cables connected? Replace dispensing unit with DDU or controller.
3X	Dispensing sensor is dirty or pressure sensor is faulty (x=1-6)	A) If a cassette can be inserted without error (single acoustic signal), the error message indicates a very dirty 'dispenser sensor' (PSDx) photosensor in dispenser module 'x' which must be cleaned. Then execute a Reset (set CMD-V4 to dispensing position). **Note:** When this error has occurred for the first time, the CMD-V4 will continue to function until operation shuts down automatically when the level of dirt increases. B) If a cassette cannot be inserted (and there is no acoustic signal even after a few seconds), the dispensing unit or controller must be replaced after inspection of the connectors on the CMD controller and the pressure sensors (PSDx).

Error code	Meaning	Explanation / Measures
8 X	Cassette empty sensor is dirty (x = 1 - 6)	Clean photosensor 'PSEx' in the relevant dispensing unit and the associated prism in the pressure carriage of the cassette. Then execute a Reset (set CMD-V4 to dispensing position). Use the 'DYK' self-test program (check status of photosensors/photosensor amplifiers) to check the level of dirt on all photosensors in KDIAG: Photosensors with status '3' or higher must be cleaned. The improvement in status can be checked after reset. **Note:** When this error has occurred for the first time, the CMD-V4 will continue to function until operation shuts down automatically when the level of dirt increases.

Error code	Meaning	Explanation / Measures
90	SAT: Photosensor PS1 (P) dirty; stacker wheel input	Carefully clean the send and receive diode between the stacker wheels with a brush. Place CMD-V4 back into cash-out position. If the status display continues to show error code '90' after powering up (reset), remove the stacker unit and, from below, clean the surfaces of the prism between the stacker wheels. Put the CMD-V4 back in its dispensing position. If the status display continues to show error code '90' after powering up (reset), the stacker has to be replaced. Use the 'DYK' self-test program (check status of photosensors / photosensor amplifiers) to check the level of dirt on all photosensors in KDIAG. Photosensors with status '3' or higher must be cleaned. The improvement in status can be checked after reset. Note: When this error has occurred for the first time, the CMD-V4 will continue to function until operation shuts down automatically when the level of dirt increases.

Error code	Meaning	Explanation / Measures
91 93 95 98	Photosensor is dirty Cassette monitoring: Photosensor PS18 'Cassette empty' (single reject) PS2 Cash-out photosensor PS27 (P) Bundle rear edge control Shutter sensor PS28	Photosensor '9x' is dirty and needs to be cleaned as soon as possible. Remove any dust from the surfaces of the corresponding transmitter/receiver (elements with a clear or purple plastic housing, respectively) and, if necessary, from the associated prism (P; two glass-clear surfaces opposite the transmitter/receiver) with a brush or compressed air. After cleaning, set the CMD-V4 to home position and wait for start-up or select '1' (Reset) on the function button. Use the 'DYK' self-test program (check status of photosensors / photosensor amplifiers) to check the level of dirt on all photosensors in KDIAG: Photosensors with status '3' or higher must be cleaned. The improvement in status can be checked after reset. Note: When the error code '9x' has occurred for the first time, the CMD-V4 will continue to function until operation shuts down automatically when the level of dirt increases (in this case the status display will show '9x', too).

Checking the note paths

Before checking the banknote paths, you should perform the following steps:

- Activate the product-specific software (see chapter "Basic Operation", section "Calling the product-specific software" in the operating manual of the basic device).
- Open the safe door (see the operating manual of the basic device).
- Holding the green release lever, pull out the CMD-V4 as far as possible (see chapter "Removal/Installation of Components", section "Pulling out / pushing in the CMD-V4").

If the release lever jams, you must check the current position of the clamp. If possible, push the clamp carefully back to its home position. Perform a reset using the function button. Now check whether you can remove the CMD-V4.

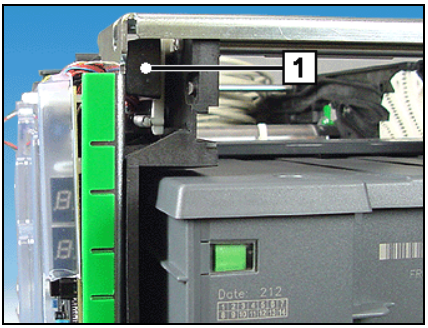
Locking/unlocking handle blocked

The locking handle is blocked by the routing disk as soon as the latter leaves its home position.

If you cannot actuate the locking handle, the note clamp is not in the stacking position or there is a routing disk error.

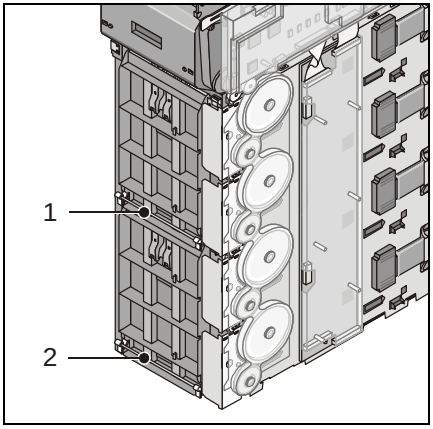
i Note that it is essential for the banknote clamp to be in the stacker position. Otherwise the clamp can fall when it is pulled out, and the pull cable can be damaged.

- Remove the reject/retract cassette (see the "Removing the cassette" section of the "Device Overview and Operation" chapter) and see which position the banknote clamp is in.
- If the banknote clamp is not in the stacking position, try carefully to move it down into the stacking position.

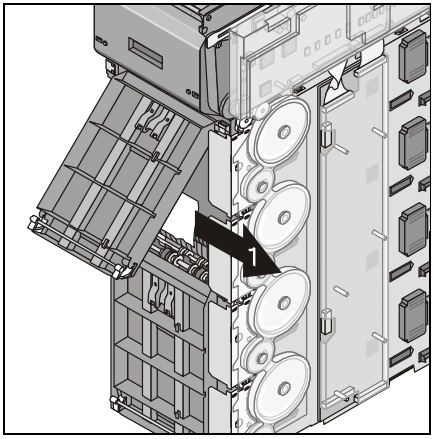


When the banknote clamp is down, you can activate the emergency unlock function (1) on the CMD-V4 and pull out the CMD-V4.

Checking the vertical transport



Raise the appropriate locking handle (1) or (2) of the dispensing unit and move the cover forward.



Check the upper/lower area of the vertical transport and remove any notes that may be there (1).

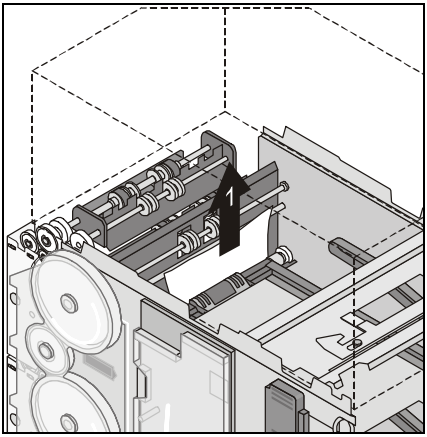
Lower the cover again until it audibly latches into place.

i Make sure that the cover lies flush with the surface and that the two sides of the locking handle are locked in position.

Checking the dispensing areas

i In the dispensing units the dispensing area (inside the device) must be checked.

The dispensing areas can only be checked when the cassettes have been removed from the dispensing units (see chapter "Device Overview and Operation", section "Removing the cassette").



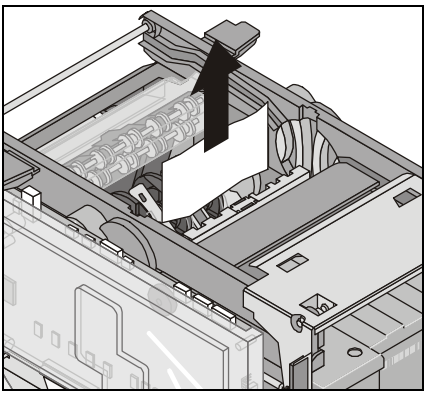
Check the dispensing area of each dispensing unit for banknotes and if necessary remove the notes (see arrow).

- Re-insert all cassettes which were removed (see chapter "Device Overview and Operation", section "Inserting the cassette").
- Log the cassettes on using the product-specific software (see the operating manual of the basic device).

Checking the stacker and output transport

i Do **not** try to open the clamp by force; you could damage it.

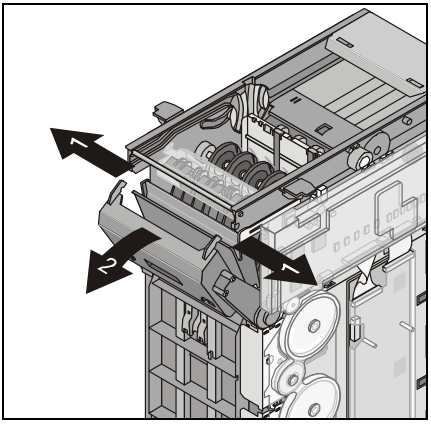
Stacker wheel area



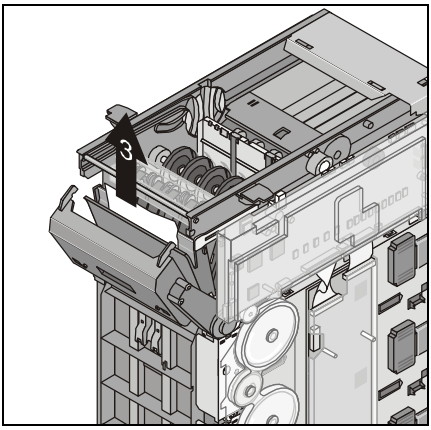
Check the area round the vertical transport and if necessary remove any notes.

Single reject area

i The function of the single reject depends on the individual configuration.



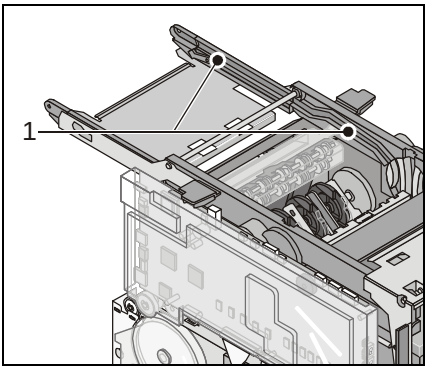
Push the green unlocking levers (1) out, and pull the flap (2) forward.



Check the storage area and remove any notes that may be there (3).

Gear tracks of the stacker and output transport

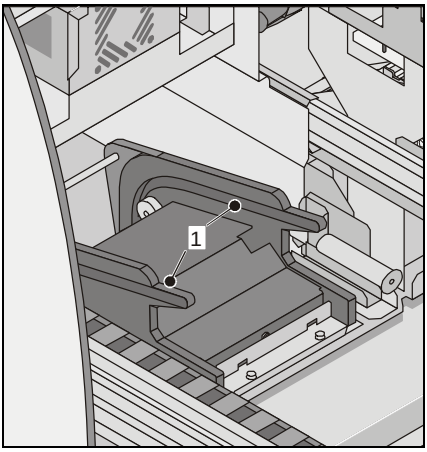
Horizontal output



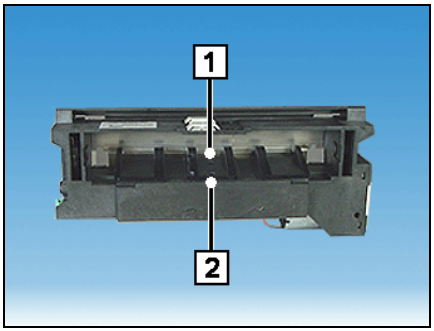
If the clamp has come to a standstill at a position outside the stacking position, you may need to check and clean the gear tracks (1).

Gear tracks of the output transport

Vertical output



If the clamp has come to a standstill at a position outside the stacking position, you may need to check and clean the gear tracks (1).



Check the photosensors (1) and (2) in the shutter area.

After checking the cash paths, proceed as follows:

- After checking the cash paths push the CMD-V4 by the green release lever back into the safe as far as possible (see the operating manual of the basic device).
- Close the safe door (see the operating manual of the basic device).

Removal/Installation of Components

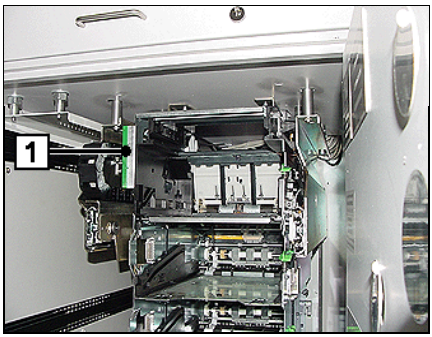
This chapter describes the removal and installation of the Cash Media Dispenser (CMD-V4) components independent of the basic device. How to remove and install the cash media dispenser in various devices is described in the respective service manuals.

Please be sure to always turn the device off before replacing any components.

After components have been replaced, the CMD-V4 must be initialized (see chapter "Start-up", section "Initializing the CMD-V4").

Pulling out / pushing in the CMD-V4

- Open the safe door (please refer to the operating manual of the basic device).



To pull it out:
Pull the CMD-V4 out of the safe by the green locking/unlocking handle (1).

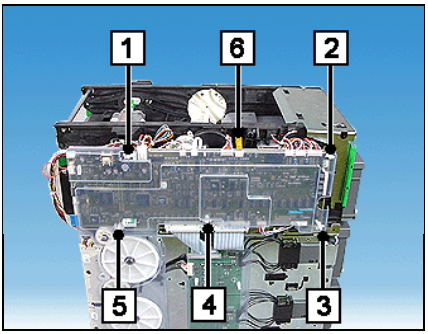
If the locking handle jams and you cannot pull out the CMD-V4, please be sure to check the "Troubleshooting" chapter.

To push it in:
Push the CMD-V4 in the device as far as possible by the green locking/unlocking handle (the CMD-V4 must audibly click into place).

CMD controller

- Open the safe door and pull out the CMD-V4 as far as possible (please refer to the operating manual of the basic device).

The CMD controller is removed including the protective cover.



To remove the CMD controller first detach all connectors from the controller.

Push the fastening bolts (1) to (5) together and carefully remove the CMD controller.

i The EEPROM (6) must always stay on the stacker.

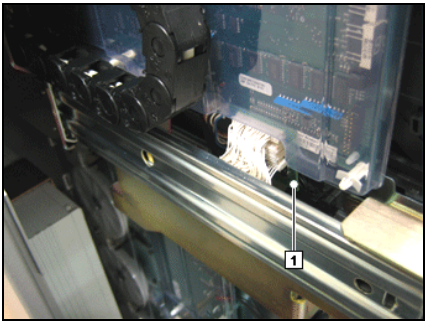
Installation

For installation the controller is placed onto the bolts. The controller must noticeably click into place.

i After the CMD controller has been replaced, the photosensors and the pressure sensor must be reinitialized and the reference value must be determined again.

Extension board for ProCash 5000 (mini)

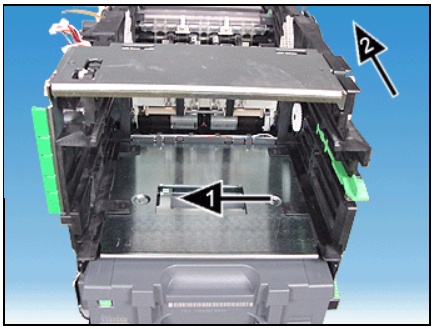
- Open the safe door and pull out the CMD-V4 as far as possible (please refer to the operating manual of the basic device).



Detach all connectors from the extension board (1) and remove the board.

Stacker

- Remove the CMD controller (see section "CMD controller").
- Remove the reject / retract cassette (see chapter "Device Overview and Operation", section "Removing the cassette").



Push the locking/unlocking lever to the left (see arrow 1) until it snaps into place.

Push the stacker back (arrow 2) and lift it up and out.

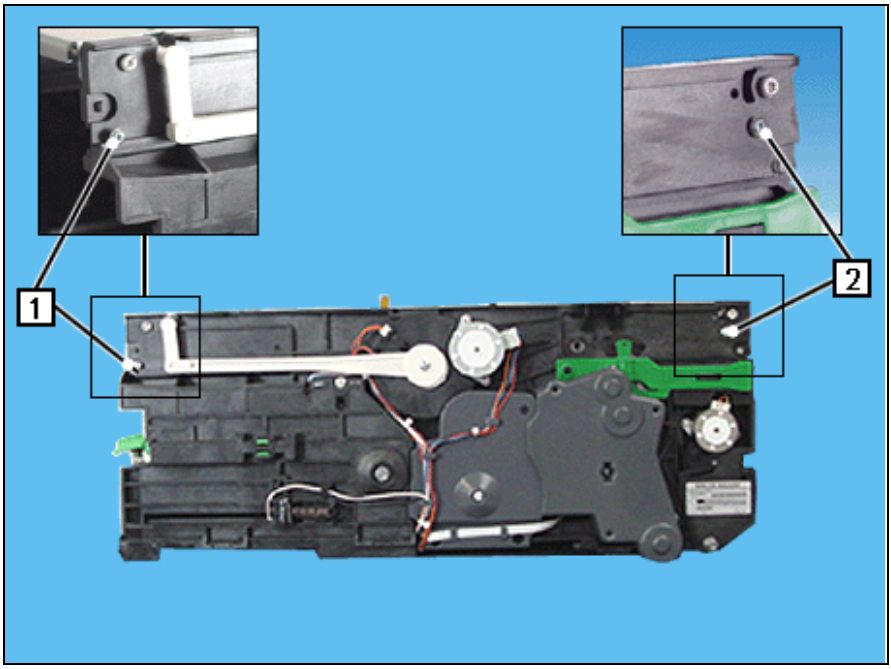
i If the stacker was delivered without the clamp, the clamp must be rebuilt.

i The bordering screws from the old stacker must used on the new stacker. The bordering screws depend on the device configuration. In the event of a clamp malfunction they are to prevent the clamp from falling out. Only use screws of the same type (length, diameter, thread type).

Reinstall it by following the same steps in reverse order.

i After the stacker has been replaced, the photosensors have to be reinitialized.

The picture shows the position of the bordering screws for the stacker.

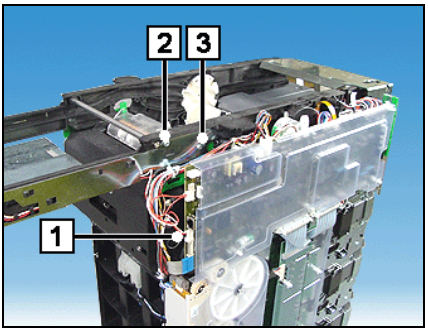


1 Bordering screw on the left 2 Bordering screw on the right

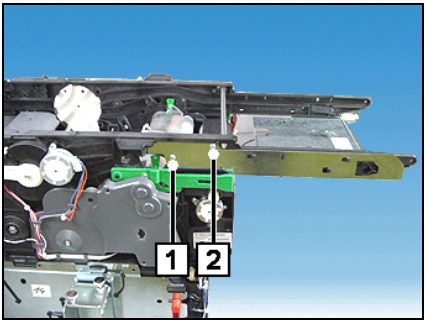
The following table provides an overview of the bordering screws which are required for the individual systems.

Bordering screws on the left	**Bordering screws on the right**
ProCash 1500xe Rearload	-
-	ProCash 1500xe Frontload
ProCash 2000xe Frontload/Rearload	ProCash 2000xe Frontload/Rearload
ProCash 2050xe	-
ProCash 2100xe Frontload/Rearload	ProCash 2100xe Frontload/Rearload
ProCash 2150xe	-
ProCash 2250xe	-
-	ProCash 2350xe

Horizontal output transport



Remove connector (1) on the left-hand side of the CMD-V4 and remove the two screws (2) and (3).



Remove screws (1) and (2) on the right-hand side.

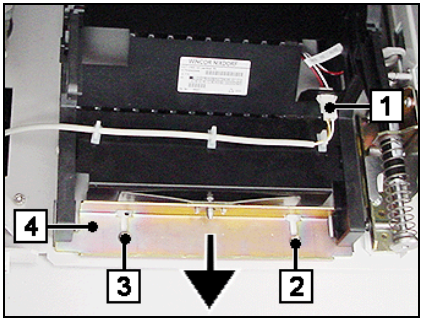
Pull the output transport apart slightly on the left and on the right and remove it.

Reinstall it by following the same steps in reverse order.

i On installation, make sure that the same type of screw is used.

Output transport ProCash 2000xe RL

- Pull the customer panel out of the device (refer to the operating and service manuals of the ProCash 2000xe).



Detach connector (1) and remove the cable from the securing clips.

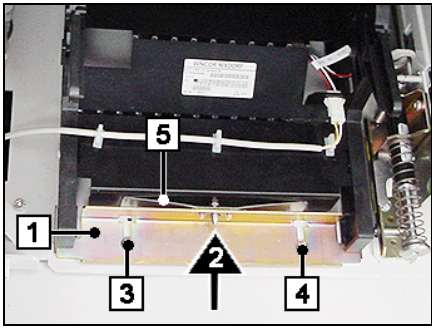
Loosen screws (2) and (3) and pull the plate (4) a little out of the device (see arrow).

Pull the output transport a little in the direction of the arrow and remove it upwards.

Reinstall it by following the same steps in reverse order.

i When replacing the output transport make sure that it fits properly in the guides of the stacker. Pull the cash media dispenser out of the device, if necessary, and then push it back in.

Adjustment



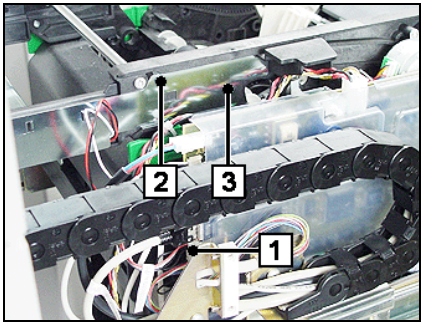
Push the plate (1) up against the output transport (2) with the cash media dispenser pushed in.

Then push the plate approx. 3 to 5 mm back and secure it with screws (3) and (4).

When the plate is secured, the spring (5) must still exert noticeable pressure on the output transport.

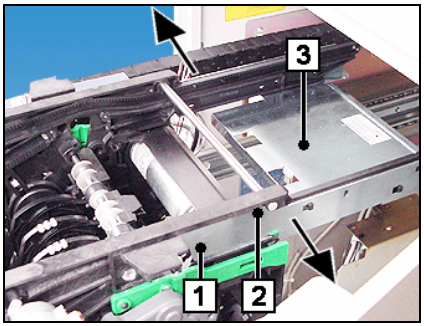
Output transport ProCash 2050xe

- Open the safe door and pull the cash media dispenser out of the device (please refer to the operating and service manuals of the ProCash 2050xe).



Detach connector (1) from the CMD controller.

Remove the screws (2) and (3).



Remove the screws (1) and (2) on the opposite side.

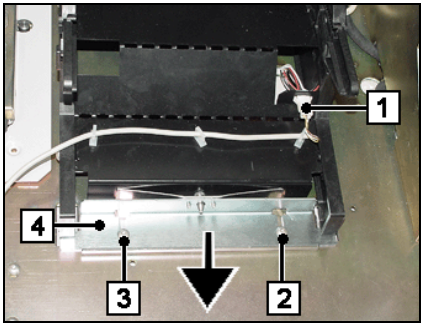
Push the two plates outwards (see arrows) and remove the output transport (3) upwards.

Reinstall it by following the same steps in reverse order.

i For installing the new output transport, you may only use the screws previously removed or screws of the same type.

Output transport ProCash 2100xe RL

- Open the door of the operating unit and pull the customer panel out of the device (see the operating and service manuals of the ProCash 2100xe).



Detach connector (1) and remove the cable from the securing clips.

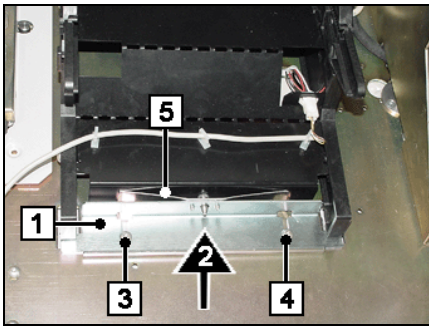
Loosen screws (2) and (3) and pull the plate (4) a little out of the device (see arrow).

Pull the output transport a little in the direction of the arrow and remove it upwards.

Reinstall it by following the same steps in reverse order.

i When replacing the output transport make sure that it fits properly in the guides of the stacker. Pull the cash media dispenser out of the device, if necessary, and then push it back in.

Adjustment



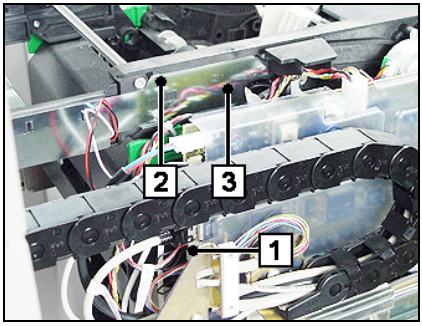
Push the plate (1) up against the output transport (2) with the cash media dispenser pushed in.

Then push the plate approx. 3 to 5 mm back and secure it with screws (3) and (4).

When the plate is secured, the spring (5) must still exert noticeable pressure on the output transport.

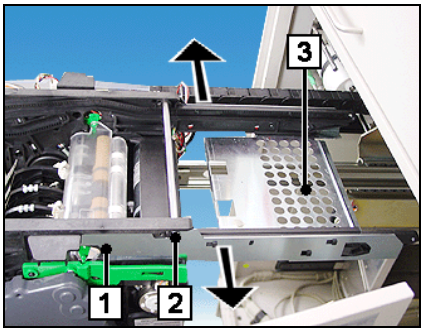
Output transport ProCash 2150xe RL

- Open the safe door and pull the cash media dispenser out of the device (please refer to the operating and service manuals of the ProCash 2150xe).



Detach connector (1) from the CMD controller.

Remove the screws (2) and (3).



Remove the screws (1) and (2) on the opposite side.

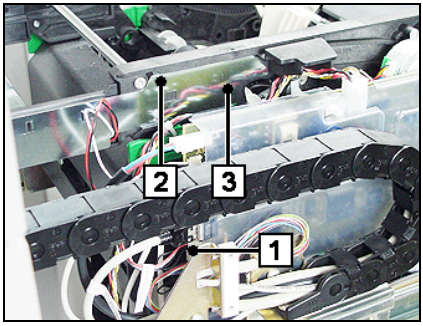
Push the two plates outwards (see arrows) and remove the output transport (3) upwards.

Reinstall it by following the same steps in reverse order.

i For installing the new output transport, you may only use the screws previously removed or screws of the same type.

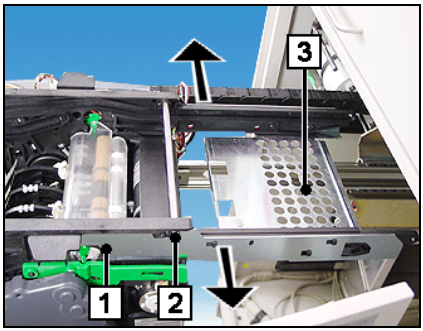
Output transport ProCash 2250xe RL

- Open the safe door and pull out the cash media dispenser (see section "Opening /closing the device").



Detach connector (1) from the CMD controller.

Remove the screws (2) and (3).



Remove the screws (1) and (2) on the opposite side.

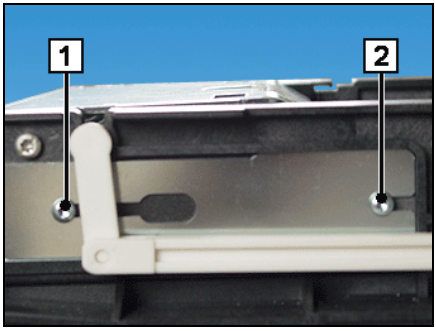
Push the two plates outwards (see arrows) and remove the output transport (3) upwards.

Reinstall it by following the same steps in reverse order.

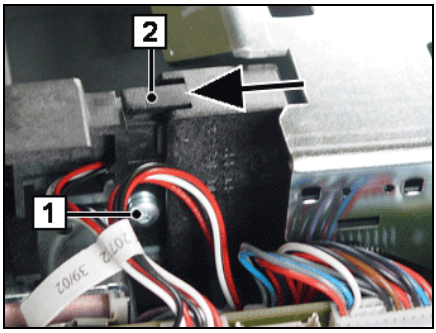
i For installing the new output transport, you may only use the screws previously removed or screws of the same type.

Output transport ProCash 2350xe

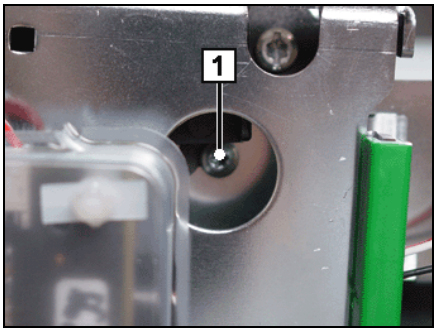
- Open the right safe door and pull the cash media dispenser out of the device as far as possible (please refer to the operating manual of the ProCash 2350xe).



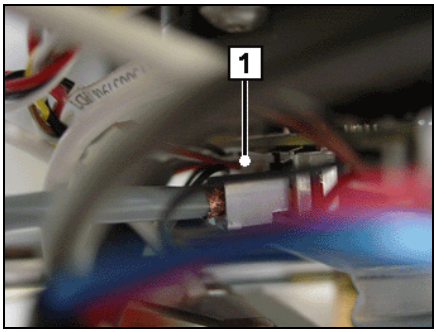
Remove the screws (1) and (2).



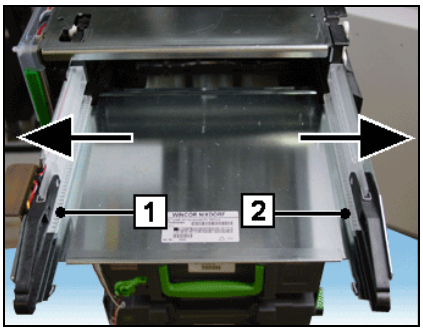
Remove the screw (1), slightly raise the catch (2) of the note lock, and push the note lock in the direction of the arrow as far as it will go.



Remove the screws (1).



Disconnect the plug (1).

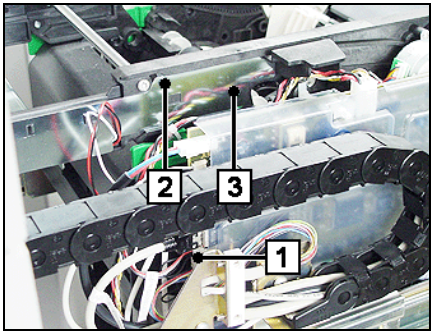


Press the plates (1) and (2) slightly outward and pull the output transport frontward out of the device.

i During installation, make sure that the note lock is pushed back to its old position. Reinstall it in the reverse order of steps.
For installing the new output transport, you may only use the screws previously removed or screws of the same type.

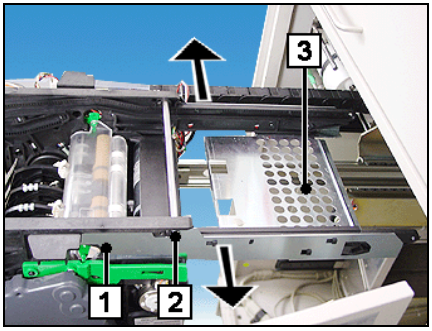
Output transport ProCash 5000 (mini)

- Open the safe door and pull the cash media dispenser out of the device as far as possible (please refer to the operating and service manuals of the ProCash 5000 (mini)).



Detach connector (1) from the CMD controller.

Remove the screws (2) and (3).



Remove the screws (1) and (2) on the opposite side.

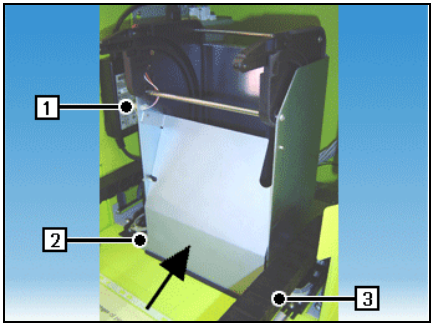
Push the two plates outwards (see arrows) and remove the output transport (3) upwards.

Reinstall it by following the same steps in reverse order.

i For installing the new output transport, you may only use the screws previously removed or screws of the same type.

Output transport Beetle/iSCAN

- Open the safe door (please refer to the operating and service manuals of the Beetle/iSCAN).



Unplug the connector (1) and release the cable from its clamps.

Remove the four screws (2) and (3), two on each side.

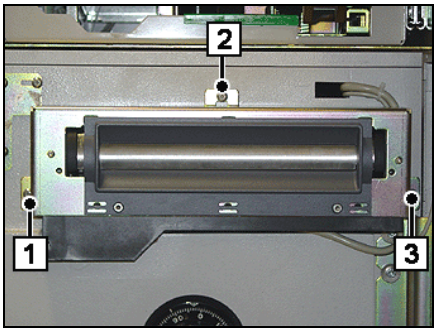
Slide the output transport slightly in the direction of the arrow and then lift it out.

Reinstall it by following the same steps in reverse order.

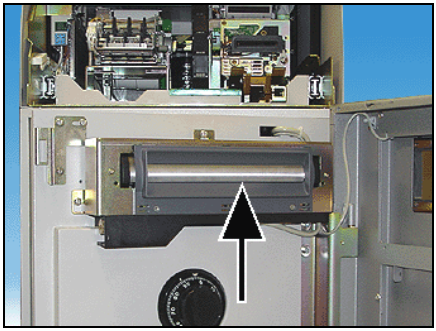
i When replacing the output transport make sure that it fits properly in the guides of the stacker. Pull the cash media dispenser out of the device, if necessary, and then push it back in.

Shutter ProCash 1500xe

- Open the front door (please refer to the ProCash 1500xe operating or service manual).

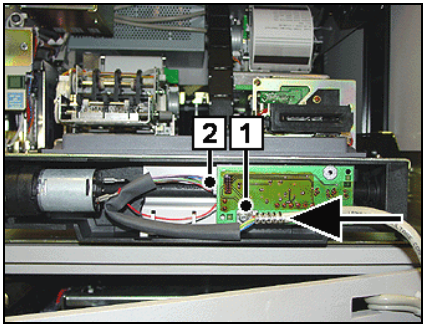


Loosen screws (1) to (3).



Open the safe door (Frontload) or pull out the CMD-V4 a little (Rearload) and remove the shutter upwards in the direction of the arrow.

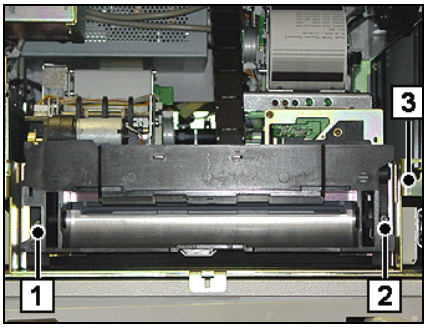
Set the shutter down on the safe.



Loosen screw (1) and push the ground connection to the left in the direction of the arrow.

Disconnect the plug (2).

Turn the shutter over.



Remove screws (1) and (2) and remove the shutter support with the cover (3). It will be needed when it is reinstalled.

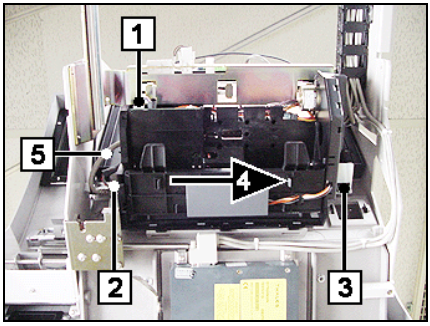
Reinstall it by following the same steps in reverse order.

i When installing the shutter be sure to push it down as far as possible.

i After adjusting the shutter complete a test dispense and output of a banknote.

Shutter ProCash 2000xe RL

- Pull the customer panel out of the device (refer to the operating and service manuals of the ProCash 2000xe).

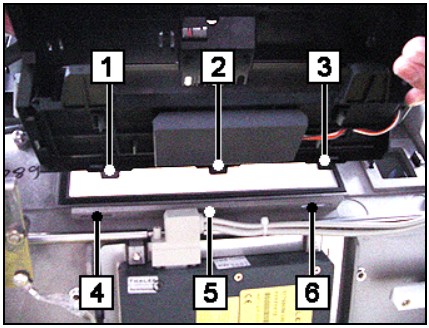


Disconnect the plug (1).

Remove screw (2) and unhook the ground strap. Loosen screw (3).

Push the shutter in the direction of the arrow (4) and remove it from the mount.

Carefully push the cable out (5) and remove the shutter.



Reinstall it by following the same steps in reverse order.

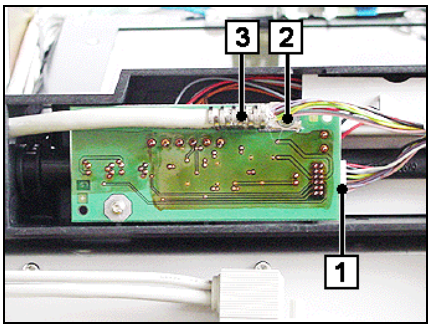
When inserting it make sure that the catches of the shutter (1) to (3) sit in the holes (4) to (6) of the shutter mount.

The shutter must be grounded! If it is not, this must be retrofitted.

Adjust the shutter so that the shutter slot matches the opening in the customer panel on the shutter's left side (see arrow).

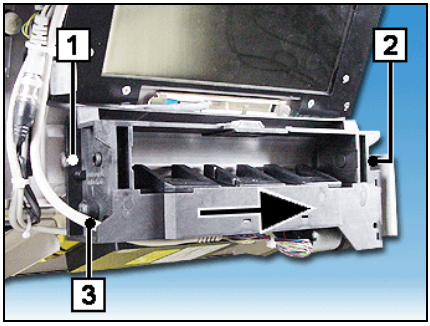
Shutter ProCash 2050xe RL

- Pull the customer panel out of the device (refer to the operating or service manual of the ProCash 2050xe).



Disconnect the plug (1).

Loosen screw (2) and unhook the ground strap (3).



Loosen the screws (1) and (2).

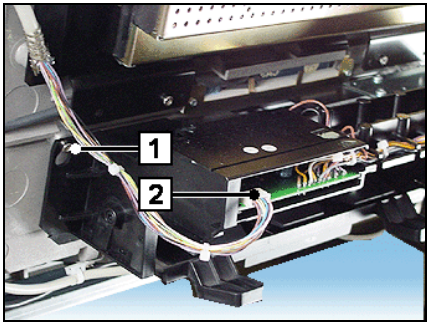
Push the shutter a little in the direction of the arrow and remove it.

Feed the cable (3) through the opening.

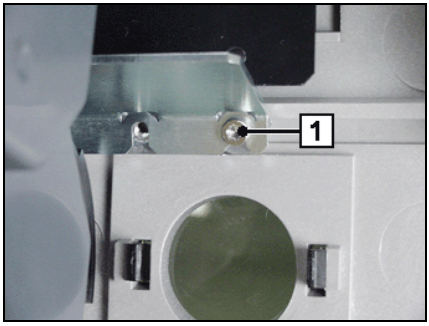
Reinstall it by following the same steps in reverse order.

Shutter ProCash 2100xe RL

- Open the door of the operating unit and pull the customer panel out of the device (see the operating or service manual of the ProCash 2100xe).



Loosen screw (1) and detach connector (2).



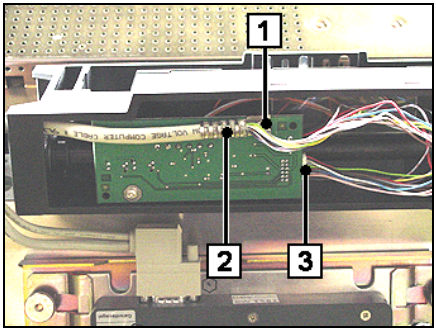
Loosen screw (1) and remove the shutter upwards.

Reinstall it by following the same steps in reverse order.

Shutter ProCash 2150xe RL

Pre-series production

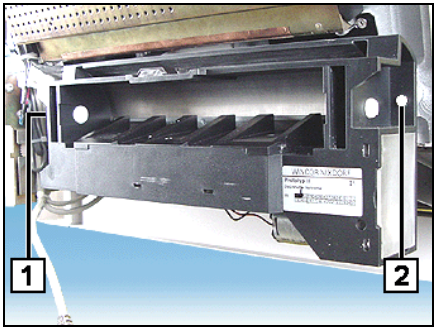
- Pull the customer panel out of the device (refer to the operating and service manuals of the ProCash 2150xe).



Loosen screw (1) on the bottom of the shutter.

Push the cable (2) slightly to the right, unhook it on the left and remove it to the left.

Disconnect the plug (3).



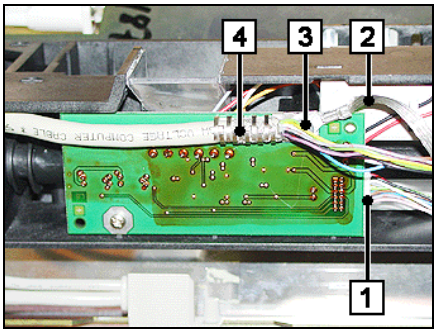
Remove screws (1) and (2) and remove the shutter upwards.

Reinstall it by following the same steps in reverse order.

The shutter must have a ground connection. If it does not have one, it must be retrofitted.

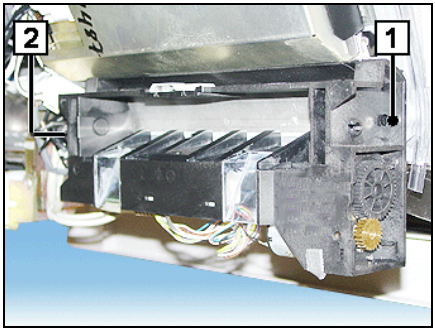
Series production

- Pull the customer panel out of the device (refer to the operating and service manuals of the ProCash 2150xe).



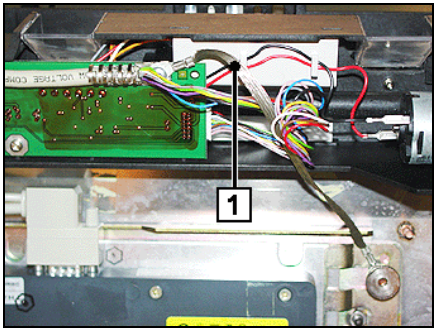
Detach connector (1) from the base of the shutter.

Remove screw (3) and loosen the ground straps (2) and (4).



Remove screws (1) and (2) and remove the shutter upwards.

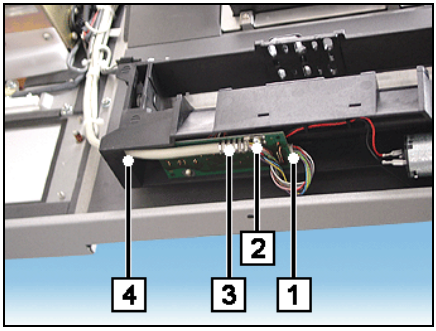
Reinstall it by following the same steps in reverse order.



⚠ When installing the shutter make sure that the ground strap (1) from the keyboard to the shutter is reconnected to the shutter's logic board!

Shutter ProCash 2250xe Drive Up

- Open the door of the operating unit (please refer to the operating and service manuals of the ProCash 2250xe Drive Up).

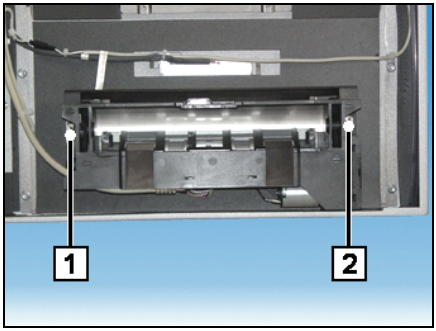


Detach connector (1) from the base of the shutter.

Loosen screw (2).

Pull the cable shoe off (3) to the left (see arrow).

Pull the cable through the side panel of the shutter (4).

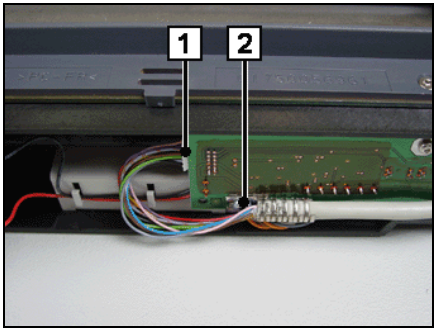


Remove screws (1) and (2) and remove the shutter.

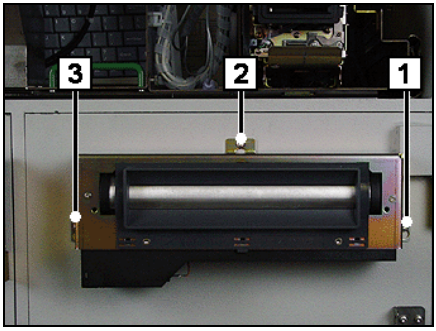
Reinstall it by following the same steps in reverse order.

Shutter ProCash 2350xe

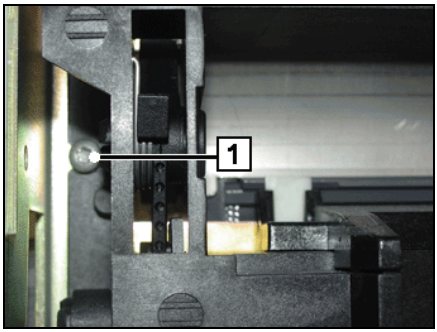
- Open the customer panel (please refer to the ProCash 2350xe operating or service manual).



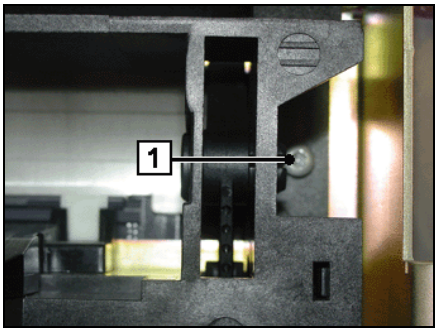
Disconnect the plug (1) and remove the grounding screw (2).



Remove screws (1) to (3) and remove the shutter to the front.



Remove the screw (1).



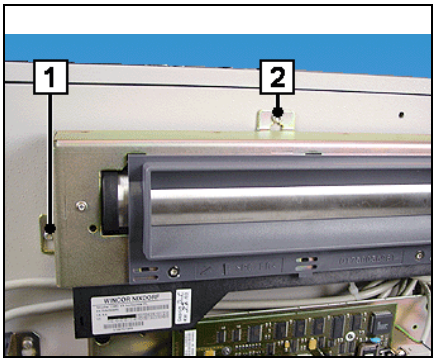
Remove screw (1) and remove the shutter upwards.

Attach the new shutter to the old mounting plate.

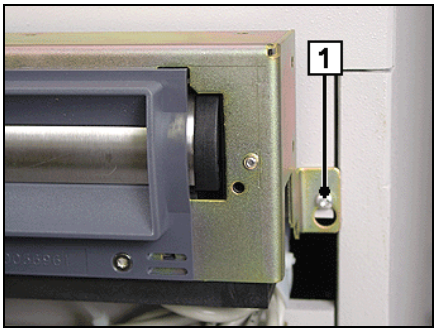
Reinstall it by following the same steps in reverse order.

Shutter ProCash 5000 (mini)

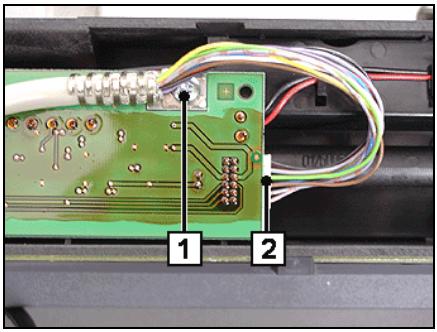
- Remove the safe door cover (please refer to the ProCash 5000 (mini) operating or service manual).



Loosen the screws (1) and (2).



Loosen the screw (1). Remove the shutter upwards and put it aside.



Disconnect the ground connection (1) and connector (2) and remove the shutter.

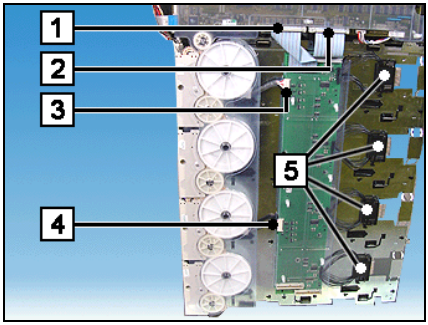
Reinstall it by following the same steps in reverse order.

Adjusting the shutter

Adjust the shutter so that the flap is in the center (see arrows).

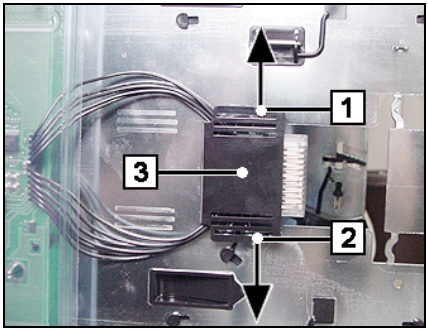
Distributor board

- Remove all cassettes from the CMD-V4 (see chapter "Device Overview and Operation", section "Removing the cassette").

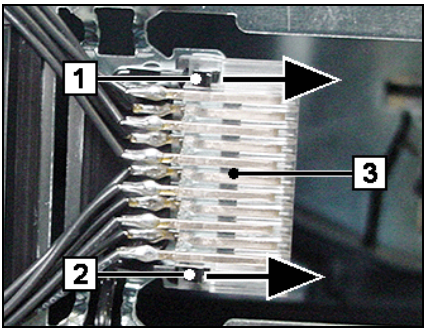


Detach tab connectors (1) and (2) from the controller and connectors (3) and (4) from the distributor board.

How to remove the connectors (5) is described below.

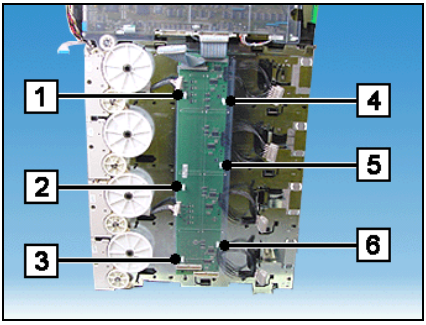


Press catches (1) and (2) in the direction of the arrows and open the hinged cover (3). Repeat this step for the other three covers.



While pushing catches (1) and (2) in the direction of the arrow, detach connector (3) forwards.

Proceed in the same way for the other three connectors.



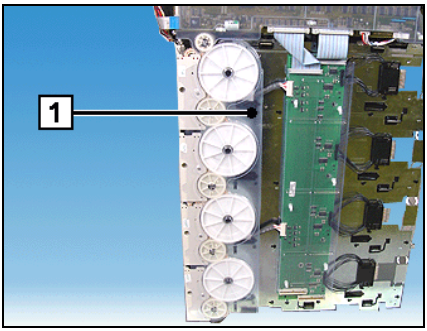
Push the white pins (1) to (6) down and remove the distributor board with its cover.

Dispensing units

Double dispensing unit

The 4-cassette housing can accommodate two double dispensing units. The upper dispensing unit always includes the thickness measuring station.

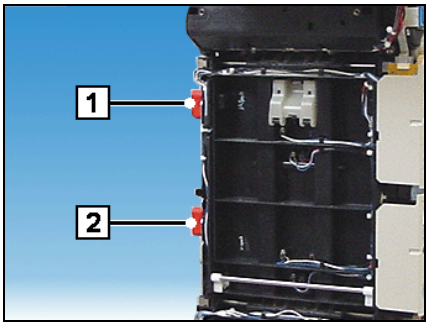
i The two dispensing units must not be confused.



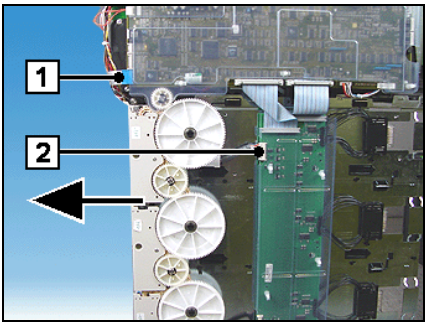
Remove the cover (1) by pulling it off.

Upper dispensing unit with thickness measuring station

Removal



Release the upper dispensing unit by turning the locking/unlocking levers (1) and (2) 90° counterclockwise.

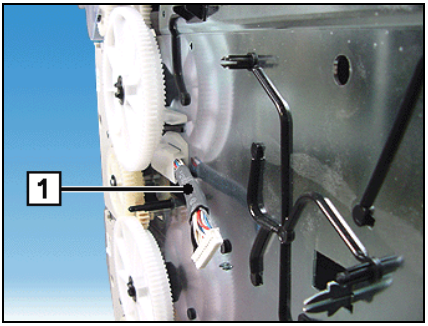


The upper dispensing unit accommodates the thickness measuring station which is connected to the CMD controller via a cable. This cable must be unplugged (1).

Detach the connector (2) from the distributor board.

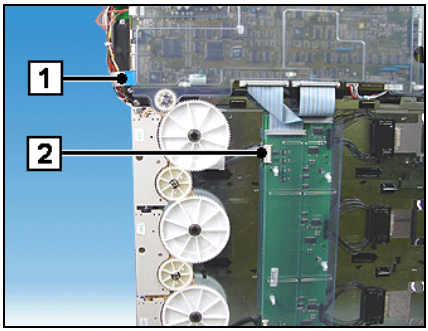
Remove the dispensing unit in the direction of the arrow.

Installation



Carefully push the connecting cable (1) between the toothed wheels and the device panel.

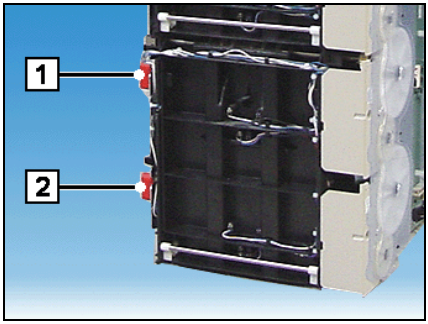
- Insert the dispensing unit and close the latches. If you cannot close them, check the proper fit of the dispensing unit.
- Carefully turn the toothed wheels if necessary to cause the dispensing unit to click into place.



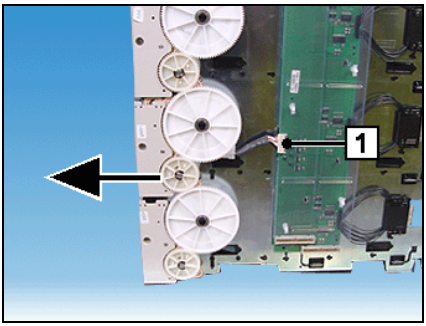
Connect the cables to the CMD controller (1) and the distributor board (2).

- Mount the protective cover.

Lower dispensing unit



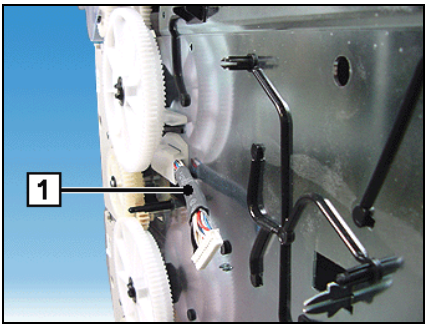
Turn the locking/unlocking levers (1) and (2) on the left side of the dispensing unit by 90° counterclockwise.



Detach the connector (1) from the distributor board.

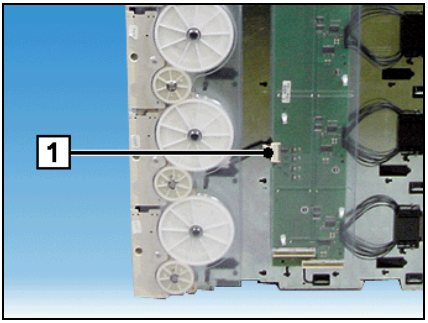
Remove the lower dispensing unit in the direction of the arrow.

Installation



Carefully push the connecting cable (1) between the toothed wheels and the device panel.

- Insert the dispensing unit and close the latches. If you cannot close them, check the proper fit of the dispensing unit.
- Carefully turn the toothed wheels if necessary to cause the dispensing unit to click into place.



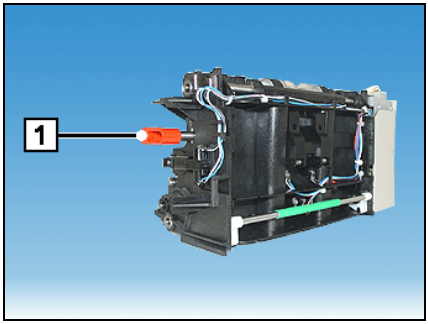
Attach the cable to the distributor board (1).

- Mount the protective cover.

Single dispensing unit

Single dispensing unit with thickness measuring station

Removal



Release the dispensing unit by turning the locking/unlocking lever (1) 90° counterclockwise.

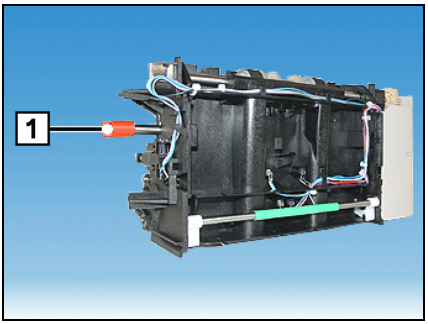
- The upper dispensing unit accommodates the thickness measuring station which is connected to the CMD controller via a cable. This cable must be unplugged.
- Detach the connector from the distributor board.
- Remove the dispensing unit.

Installation

- Carefully push the connecting cable between the toothed wheels and the device panel (see section "Double dispensing unit").
- Insert the dispensing unit and close the latches. If you cannot close them, check the proper fit of the dispensing unit.
- Carefully turn the toothed wheels if necessary to cause the dispensing unit to click into place (see section "Double dispensing unit").
- Connect the cables to the CMD controller and the distributor board.
- Mount the protective cover on the CMD controller.

Single dispensing unit without thickness measuring station

Removal



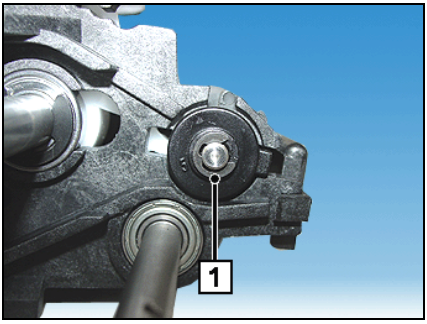
Turn the locking/unlocking lever (1) on the left side of the dispensing unit by 90° counterclockwise.

- Detach the connector from the distributor board.
- Remove the dispensing unit.

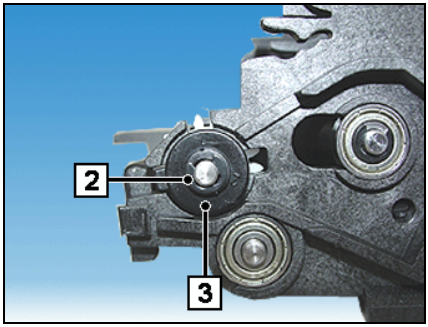
Installation

- Carefully push the connecting cable between the toothed wheels and the device panel (see section "Double dispensing unit").
- Insert the dispensing unit and close the latches. If you cannot close them, check the proper fit of the dispensing unit.
- Carefully turn the toothed wheels if necessary to cause the dispensing unit to click into place (see section "Double dispensing unit").
- Attach the cable to the distributor board.
- Mount the protective cover.

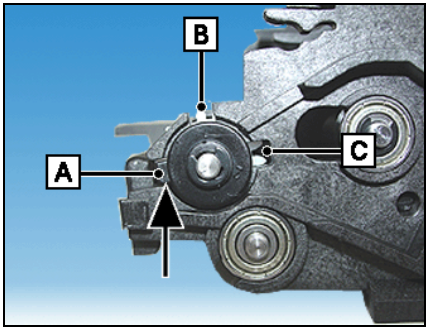
Adjusting the dispensing unit



Remove the circlip (1) on the left side and ...



... the circlip (2) on the right side. Slightly pull the two eccentrics (3) out so that they can be turned.

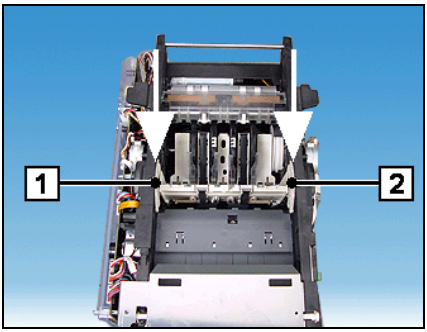


Move the eccentric mark A, B or C to the required adjustment position. Adjustment position A is indicated in the illustration with an arrow.

You can find more information in the "Adjustment eccentric" section in the "Function and Integration" chapter.

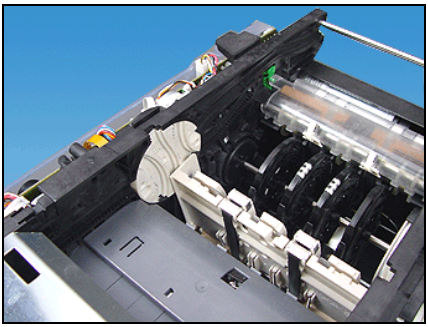
Clamp

Removal



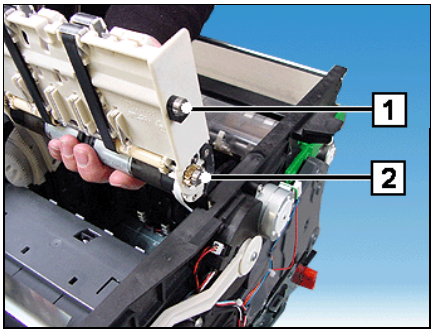
Turn the two routing disks (1) and (2) in the direction of the arrow as far as possible.

The clamp closes at the same time and has to engage.



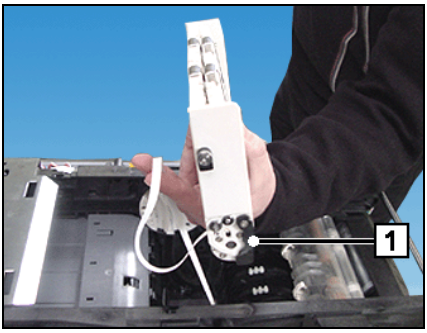
Turn the routing disks back by approx. 90° (as shown in the picture) so that the clamp can be removed upwards.

i Make sure that the clamp is not opened improperly.

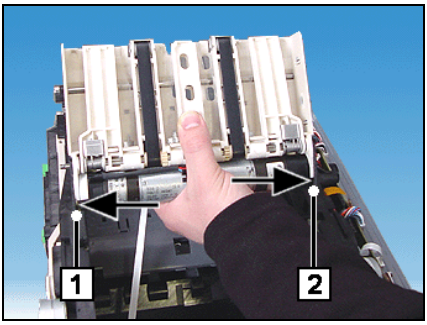


i When removing the clamp remember that the ball bearings are loosely attached and can fall out.

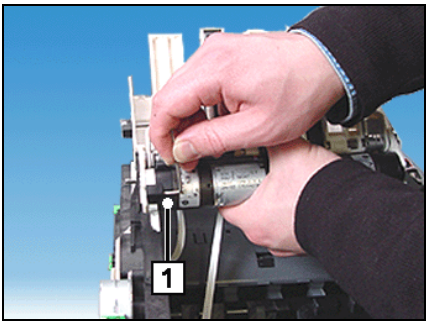
Remove the clamp upwards. Remove the ball bearings with the black hooks (1) and the toothed wheels (2) on both sides of the clamp.



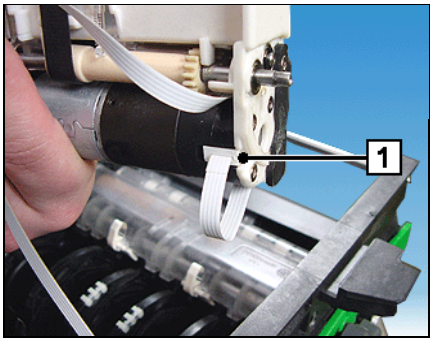
The illustration shows the latch (1) on the left/hand side used to open the clamp.



Open the clamp by pushing the latches (1) and (2) on the left and on the right side in the direction of the arrow.



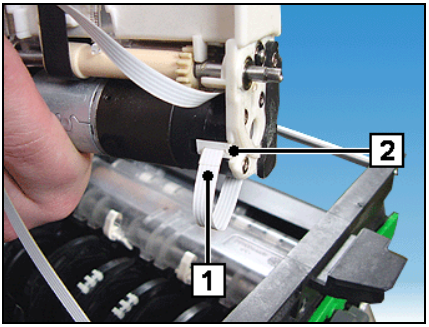
Push out the securing pin (1) and hold onto the cable.



Loosen the cable fixing (1) and pull out the cable.

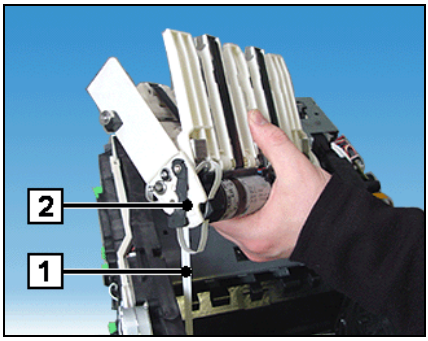
i Careful!
Make sure that the cable is not pulled back again and secure it, if necessary.

Installation



Feed the cable in (1) as shown in the picture by moving it slightly back and forth.

Plug in the cable (1) and press the cable fixing (2) shut.

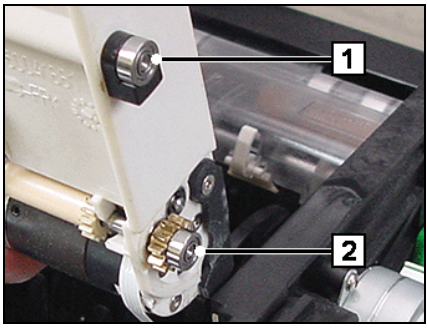


Pull the cable (1) taut.

Insert the securing pin (2) with the clamp open.

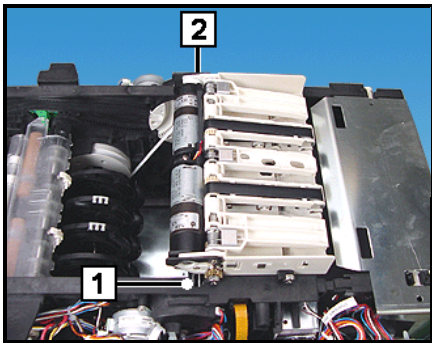
(In the illustration the cable is not yet pulled taut).

Close the clamp. The two latches, one on each side, must be engaged manually.



Put the two black hooks and the ball bearings (1) on the left and right side of the clamp back in place.

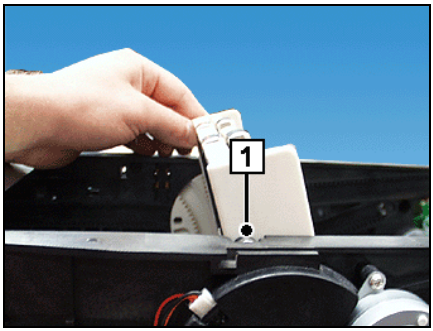
Slip on the two toothed wheels and the ball bearings (2). The toothed wheel is pushed on with the bulging side pointing inside.



Set the clamp down on the stacker, as shown in the illustration. Push the clamp into the routing disk.

The toothed wheel must be inserted evenly (1) and (2).

i The clamp must be closed when it is inserted.



Make sure that the clamp is inserted correctly by positioning the ball bearing flush with the side panel of the stacker on one side (1). The ball bearing at the other side panel must also be flush.

- Let the clamp slide in carefully. Press the clamp down carefully until it snaps open slightly.

Maintenance and Service

The information required for carrying out troubleshooting and maintenance on the individual components can be found in the chapters in this manual.

When carrying out work on components and modules that carry an electrical charge, this equipment must first be disconnected from the power supply. Due to construction, it is not enough to switch off the power switch on the power distributor. In addition, the safety plug must be disconnected from the power distributor.

Maintenance

Maintenance intervals

Preventive maintenance is required for the CMD-V4 every two years or, at the latest, after 200,000 transactions.

Performing maintenance

All photosensors are only allowed to be cleaned in a dry state.

Preventive maintenance consists of the following:

- If any error statistics exist, evaluate them to find any serious problems and take them especially into account during maintenance (possibly replace components).
- After maintenance, check the quality of the photosensors with special test jobs. The quality must be at least service level (status * 2).
- Remove the cassettes from the CMD-V4.

- Clean the cassettes. Check all function parts for damage, ease of movement and play.
- Turn off the CMD-V4.
- Remove the stacker, possibly with the horizontal output transport, and the dispensing units.
- Check that the belts are correctly positioned on the guiding rolls.
- Clean the SAT and the dispensing units using a brush.
- Clean all photosensors/prisms and transport rollers in the dispensing units and the stacker with compressed air.
- Function testing is carried out by the system software. (You will find further information in the software documentation.)

After maintenance, clear the parameters in the CMD controller's CMOS. Then the CMD has to be initialized and reference values have to be calculated for all note types (See the "Initializing the CMD-V4" section in the "Start-up" chapter.

Then, using a test program or the actual application, you have to run a dispensing test in which at least five notes have to be dispensed from each cassette without errors.

Stacker

- Visually inspect the stacker for damage and dirt.
- Clean the stacker using a vacuum cleaner, brush, cloth or compressed air.
- Clean all photosensors using a brush, cloth or compressed air. All photosensors are only allowed to be cleaned in a dry state.
- Check that the routing disks move easily.

Output transport

- Remove the output transport (refer to chapter "Removal/Installation of Components").
- Visually inspect the output transport for damage and dirt.
- Clean the output transport using a vacuum cleaner, brush, cloth or compressed air.
- Reinstall the output transport (refer to chapter "Removal/Installation of Components").

Shutter

- Visually inspect the shutter for damage and dirt.
- Clean all photosensors using a brush, cloth or compressed air. All photosensors are only allowed to be cleaned in a dry state.
- Unlock the shutter and check the mechanical parts for ease of movement.

Cash-out cassettes

- Visually inspect the cash-out cassettes for damage.
- Clean the cash-out cassettes using a vacuum cleaner, brush, cloth or compressed air.
- Check the settings for the correct note size (in the cover too).
- Check the cassette pressure carriage to see that it is in its position properly, and adjust it if necessary.

Reject / retract cassette

- Visually inspect the reject / retract cassette for damage and dirt.
- Clean the reject / retract cassette using a vacuum cleaner, brush, cloth or compressed air.
- Clean the rollers with isopropyl alcohol if necessary.
- Check that the toothed drive wheel is sitting properly.
- Check for even pressure of the transport rollers at the intake of the cassette.

General

- Check that the components have been installed correctly.
- Check that all cables have been laid safely and fastened correctly.
- Check the ground connections and replace them if necessary.
- Check the functioning of locks and make contacts and adjust them.

Approved maintenance materials

You can order the items listed below electronically or from our service partner.

Orders:	http://extranet.wincor-nixdorf.com http://its.siemens.de/lobs/its/its_log/ersin_gr.htm
If you have questions concerning logistics please contact:	mailto:serviceslogistics@wincor-nixdorf.com
If you have technical questions please contact:	mailto:servicesupport@wincor-nixdorf.com

Commercial name / product name	**Code number**	**Stock number**
Ballistol oil	NCA:31399.00.0.52	6383009
Barrierta oil 10ml	GFI:BARRIERTA-10ML	2056293
Multi-purpose grease BP LS2, 50ml	01750049230	2085328
Screw lacquer, red, 20 ml	NCA:39692.00.0.52	6410170
SNI special grease	NCA: 32555.00.2.52	6387748
Heat-insulating packing for gas soldering iron	SON:QC1	2032858
Portasol gas soldering iron, filled	NCA:30071.00.8.40	6377157
Exxon Gas	WVC:079517	2030869
Maintenance fluid, 100ml — pump spray	TPI:VC891	2030745
Compressed air R134A, 500 ml *	MSG:79507167	2031656
Flat brush 1"	NCA: 77059.00.6.40	6517714
Flat paintbrush 1.5"	NCA:77060.00.6.40	6517722
Kleenex cleaning cloths	NCA:65439.00.8.40	6476929
LUBRA metallic care fluid, 12 ml	TDG:55002	2030522
Q-tips	NCA:65441.00.5.40	6476953
Texpad cleaning cloth (TX801)	NCA:61970.00.2.28	6466206
Universal cleaning cloth	NCA:30069.00.1.40	6377122

* The screw valve with 1.5. m hose from Pressair can still be used with pressure gas R134A. The valve can be ordered from Wincor Nixdorf International GmbH with the order number 1060003336, if necessary.

You will find a list of all the cleaning and maintenance materials released by Wincor Nixdorf International GmbH in the intranet or extranet.

Please note the manufacturer's specifications on the packaging and on the enclosed information sheet.

The product may be damaged or soiled if materials are used that are not approved or if they are used improperly.

Please dispose of the packaging and empty containers according to the applicable regulations of your country.

Pin Assignments

Power supply connector (supply voltage)

Connector: 2-pin AMP, pins 90°

Pin	Signal name	Meaning
1	P24 V	Supply voltage +24 V
2	GNDNT	Ground for +24 V

Safety switch

Connector: 3-pin DUBOX, 1 row, 90°

Pin	Signal name	Meaning
1	Relay	Safety cut-off relay
2	GND	Ground
3	NC	not connected

Basic module

Elements	
HS2	Lifting magnet of single reject switch
SM6	Stepper motor for tray selection in reject/retract cassette
DPS4	Digital photosensor for tray selection
S1	Micro switch: Reject/retract cassette available
PS1	Cash path photosensor (reflective photosensor)
PS21	Cash path photosensor (controlled)

Connector: 20-pin DUBOX, 2 rows, 90°

Pin	Signal name	Meaning
1	SM6PH1P	Stepper motor SM6 phase 1, Plus connection
2	SM6PH1M	Stepper motor SM6 phase 1, Minus connection
3	SM6PH2P	Stepper motor SM6 phase 2, Plus connection
4	SM6PH2M	Stepper motor SM6 phase 2, Minus connection
5	H2P	Single reject switch, Plus connection
6	H2M	Single reject switch, Minus connection
7	P12V	Digital photosensor DPS4, power supply
8	GND	Digital photosensor DPS4, Ground
9	GL4	Digital photosensor DPS4, output signal
10	IGSAMOUT	Digital photosensor DPS4, Transmit current Plus
11	S1	Micro switch: Reject/retract cassette available, signal
12	GND	Micro switch: Reject/retract cassette available, ground
13	VCCL	PS21 receiver, collector
14	LAGT212235	PS21 receiver, emitter
15	VCCL	PS1 receiver, collector
16	LAGTL1	PS1 receiver, emitter (reflective photosensor)
17	IQLSMIN	Photosensor transmit current Plus LED PS1 (reflective)
18	IXGMOUT	Photosensor transmit current Minus
19	IQLS	Photosensor transmit current Plus Transmit LED PS21
20	IQLS56VN	Photosensor transmit current Minus

Main motor M1

Elements	
DCM1	Main motor

Connector: 2-pin AMP, female connector 90°

Pin	Signal name	Meaning
1	M1P	Main motor, Plus connection
2	M1M	Main motor, Minus connection

Stacker

Elements	
DCM3	Swiveling motor for collecting tray
DPS1/DPS3	Digital photosensors for collecting tray position
DCM5	Stepper motor for bundle reject switch
DPS8/DPS9	Digital photosensors for bundle reject switch
PS29, PS22	Cash path photosensors (controlled)
PS18, PS19	PS29 TOPLED (attention: constant light!)
T1	Timing disk DCM1

Connector: 34-pin DUBOX, 2 rows, 90°

Pin	Signal name	Meaning
1	SM5PH1P	Stepper motor DCM5 phase 1, Plus connection
2	SM5PH1M	Stepper motor DCM5 phase 1, Minus connection
3	SM5PH2P	Stepper motor DCM5 phase 2, Plus connection
4	SM5PH2M	Stepper motor DCM5 phase 2, Minus connection
5	M3P	DC motor DCM3, Plus connection
6	GNDL	DC motor DCM3, Minus connection
7	P12V	Power supply DPS1/DPS3 and DPS8/DPS9
8	GND	Connection to ground DPS1/DP3 and DPS8/DPS9
9	GL1N	Output signal Digital photosensor DPS1, Dispensing position
10	GL3N	Output signal Digital photosensor DPS3, Cash-out position
11	GL8N	Output signal Digital photosensor DPS8, Transport position
12	GL9N	Output signal Digital photosensor DPS9, Reject position
13	IGSAMIN	Transmit current Plus (DPS1/3 and DPS8/9)
14	IGSAMOUT	Transmit current Minus (DPS1/3 and DPS8/9)
15	P12V	PS29 receiver, collector
16	LAGT2629	PS29 receiver, emitter
17	VCCL	PS22 receiver, collector
18	LAGT212235	PS22 receiver, emitter
19	VCCL	PS18 receiver, collector
20	LAGT18	PS18 receiver, emitter
21	VCCL	PS19 receiver, collector
22	LAGT19	PS19 receiver, emitter
23	IXGMOUT	Photosensor transmit current Plus (PS29, TOPLED)
24	IQLS	Photosensor transmit current Minus
25	IQLS	Photosensor transmit current Plus (PS22, PS18, PS19)
26	IQLS34VN	Photosensor transmit current Minus

Pin	Signal name	Meaning
27		Free
28	Vcc	Timing disk of main motor, Power supply
29	T1OUT	Timing disk of main motor, output signal
30	GND	Timing disk of main motor, Ground
31		Free
32		Free
33		Free
34		Free

Frontload module

Elements	
PS33, PS35	Cash path photosensors (controlled)
PS26	PS26 TOPLED (attention: constant light!)

Connector: 10-pin DUBOX, 2 rows, 90°

Pin	Signal name	Meaning
1	P12V	PS26 receiver, collector
2	LAGT2629	PS26 receiver, emitter - attention: constant light!
3	VCCL	PS35 receiver, collector
4	LAGT212235	PS35 receiver, emitter
5	VCCL	PS33 receiver, collector
6	LAGT33	PS33 receiver, emitter
7	IXGMOUT	Photosensor transmit current Plus (PS26)
8	IQLS	Photosensor transmit current Minus
9	IQLSSH	Photosensor transmit current Plus (PS33, PS35)
10	GND	Photosensor transmit current Minus

Dispensing unit 1 (module positions 1 and 2)

Elements	
CL1, CL2	Electromagnetic clutch (dispensing unit - position 1, 2)
HR1,HR2	Lifting magnet retaining spring (dispensing unit - position 1, 2)
PSD1/2	Photosensor dispensing sensor, controlled (dispensing unit - position 1, 2)
PSE1/2	Photosensor 'cassette empty sensor' (dispensing unit - position 1, 2)
LANDR1/2	Note pressure measurement (dispensing unit - position 1, 2)

Connector: 24-pin DUBOX, 2 rows, 90°

Pin	**Signal name**	**Meaning**
1	P24V	Electromagnetic clutch, Plus connection, dispensing unit - position 1
2	EK1	Electromagnetic clutch, Minus connection, dispensing unit - position 1
3	P24V	Lifting magnet retaining spring, Plus connection (dispensing unit - position 1)
4	HR1	Lifting magnet retaining spring, Minus connection (dispensing unit - position 1)
5	P24V	Electromagnetic clutch, Plus connection (dispensing unit - position 2)
6	EK2	Electromagnetic clutch, Minus connection (dispensing unit - position 2)
7	P24V	Lifting magnet retaining spring, Plus connection (dispensing unit - position 2)
8	HR2	Lifting magnet retaining spring, Minus connection (dispensing unit - position 2)
9	P12V	+12 V for pressure measurement (dispensing unit - position 1)
10	P12V	+12 V for pressure measurement (dispensing unit - position 2)
11	GND	Ground for pressure measurement (dispensing unit - position 1)

Pin	Signal name	Meaning
12	GND	Ground for pressure measurement (dispensing unit - position 2)
13	UANDR1	Signal of pressure measurement (dispensing unit - position 1)
14	UANDR2	Signal of pressure measurement (dispensing unit - position 2)
15	IAN12IN	Transmit current for pressure measurement (reflective photosensor)
16	IAN12OUT	Transmit current for pressure measurement (reflective photosensor)
17	VCCL	all receivers, collector
18	LAM135	PSD1 receiver, emitter
19	LKL135	PSE1 receiver, emitter
20	LAM246	PSD2 receiver, emitter
21	LKL246	PSE2 receiver, emitter
22	- nc -	- not connected -
23	IQLS12VN	Photosensor transmit current Plus (PSD1, 2; PSE1, 2)
24	IQLS12	Photosensor transmit current Minus (PSD1, 2; PSE1, 2)

Cassette connector at dispensing unit 1

(Module positions 1 and 2)

Elements	
	serial EEPROM
	Stepper motor

Connector: 20-pin DUBOX, 2 rows, 90°

Pin	Signal name	Meaning
1	EEDAT	serial EEPROMs: data line for cassette 1
2	EEDAT	serial EEPROMs: data line for cassette 2
3	EETAKT	serial EEPROMs: clock line for cassette 1
4	EETAKT	serial EEPROMs: clock line for cassette 2
5	EECSK1	serial EEPROM cassette 1: Select
6	EECSK2	serial EEPROM cassette 2: Select
7	GND	Ground (EEPROM, measuring electronics) for cassette 1
8	GND	Ground (EEPROM, measuring electronics) for cassette 2
9	VCCSWK1	Switched power supply, cassette 1
10	VCCSWK2	Switched power supply, cassette 2
11	- nc -	- not connected -
12	- nc -	- not connected -
13	SMK1P1P	Stepper motor cassette 1, Phase 1 Plus
14	SMK2P1P	Stepper motor cassette 2, Phase 1 Plus
15	SMK1P1M	Stepper motor cassette 1, Phase 1 Minus
16	SMK2P1M	Stepper motor cassette 2, Phase 1 Minus
17	SMK1P2P	Stepper motor cassette 1, Phase 2 Plus
18	SMK2P2P	Stepper motor cassette 2, Phase 2 Plus
19	SMK1P2M	Stepper motor cassette 1, Phase 2 Minus
20	SMK2P2M	Stepper motor cassette 2, Phase 2 Minus

Dispensing unit 2

Module positions 3 and 4

Elements	
CL3, CL4	Electromagnetic clutch (dispensing unit - position 3, 4)
HR3, HR4	Lifting magnet retaining spring (dispensing unit - position 3, 4)
PSD 3/4	Photosensor dispensing sensor, controlled (dispensing unit - position 3, 4)
PSE 3/4	Photosensor 'cassette empty sensor' (dispensing unit - position 3, 4)
LANDR3/4	Note pressure measurement (dispensing unit - position 3, 4)

Connector: 24-pin DUBOX, 2 rows, 90°

Pin	**Signal name**	**Meaning**
1	P24V	Electromagnetic clutch, Plus connection (dispensing unit - position 3)
2	EK3	Electromagnetic clutch, Minus connection, dispensing unit - position 3
3	P24V	Lifting magnet retaining spring, Plus connection (dispensing unit - position 3)
4	HR3	Electromagnetic clutch, Minus connection (dispensing unit - position 3)
5	P24V	Electromagnetic clutch, Plus connection (dispensing unit - position 4)
6	EK4	Electromagnetic clutch, Minus connection (dispensing unit - position 4)
7	P24V	Lifting magnet retaining spring, Plus connection (dispensing unit - position 4)
8	HR4	Electromagnetic clutch, Minus connection (dispensing unit - position 4)
9	P12V	+12 V for pressure measurement (dispensing unit - position 3)
10	P12V	+12 V for pressure measurement (dispensing unit -

		position 4)
Pin	**Signal name**	**Meaning**
11	GND	Ground for pressure measurement (dispensing unit - position 3)
12	GND	Ground for pressure measurement (dispensing unit - position 4)
13	UANDR3	Signal of pressure measurement (dispensing unit - position 3)
14	UANDR4	Signal of pressure measurement (dispensing unit - position 4)
15	IAN34IN	Transmit current for pressure measurement (reflective photosensor)
16	IAN34OUT	Transmit current for pressure measurement (reflective photosensor)
17	VCCL	PSD3 receiver, collector
18	LAM135	PSD3 receiver, emitter
19	LKL135	PSE3 receiver, emitter
20	LAM246	PSD4 receiver, emitter
21	LKL246	PSE4 receiver, emitter
22	- nc -	- not connected -
23	IQLS34VN	Photosensor transmit current Plus (PSD3, 4; PSE3, 4)
24	IQLS34	Photosensor transmit current Minus (PSD3, 4; PSE3, 4)

Cassette connector at dispensing unit 2

(Module positions 3 and 4)

Elements	
	Serial EEPROM
	Stepper motor

Connector: 20-pin DUBOX, 2 rows, 90°

Pin	Signal name	Meaning
1	EEDAT	serial EEPROMs: data line for cassette 3
2	EEDAT	serial EEPROMs: data line for cassette 4
3	EETAKT	serial EEPROMs: clock line for cassette 3
4	EETAKT	serial EEPROMs: clock line for cassette 4
5	EECSK3	serial EEPROM cassette 3: Select
6	EECSK4	serial EEPROM cassette 4: Select
7	GND	Ground (EEPROM, measuring electronics) for cassette 3
8	GND	Ground (EEPROM, measuring electronics) for cassette 4
9	VCCSWK3	Switched power supply, cassette 3
10	VCCSWK4	Switched power supply, cassette 4
11	- nc -	- not connected -
12	- nc -	- not connected -
13	SMK3P1P	Stepper motor cassette 3, Phase 1 Plus
14	SMK4P1P	Stepper motor cassette 4, Phase 1 Plus
15	SMK3P1M	Stepper motor cassette 3, Phase 1 Minus
16	SMK4P1M	Stepper motor cassette 4, Phase 1 Minus
17	SMK3P2P	Stepper motor cassette 3, Phase 2 Plus
18	SMK4P2P	Stepper motor cassette 4, Phase 2 Plus
19	SMK3P2M	Stepper motor cassette 3, Phase 2 Minus
20	SMK4P2M	Stepper motor cassette 4, Phase 2 Minus

Extension connector for dispensing unit 3

(Module positions 5 and 6)

An extension PCB containing the power drivers, power sources, level converters and the like is used for dispensing unit 3 (positions 5 and 6). Logical signals (TTL level or analog level) are passed via the extension connector. The elements handled by the extension PCB are listed below.

Elements	
CL5, CL6	Electromagnetic clutch (dispensing unit - position 5, 6)
HR5, HR6	Lifting magnet retaining spring (dispensing unit - position 5, 6)
PSD5/6	Photosensor dispensing sensor, controlled (dispensing unit - position 5, 6)
PSE5/6	Photosensor 'cassette empty sensor' (dispensing unit - position 5, 6)
EEPR5/6	serial EEPROM cassette 5, 6
SMK5/6	Stepper motor cassette 5, 6
LANDR5/6	Note pressure measurement (dispensing unit - position 5, 6)

Connector: 40-pin Berg pins, LOW profile, 2 rows, 90°

Pin	**Signal name**	**Meaning**
1	GNDL	Ground for load current
2	MATAKT	Magnet for clock
3	GNDL	Ground for load current
4	GNDL	Ground for load current
5	P24V	+24 V for load current
6	P24V	+24 V for load current
7	V5	Selection signal for dispensing unit - position 5
8	V6	Selection signal for dispensing unit - position 6
9	IOEK	Electromagnetic clutch
10	IOHR	Lifting magnet retaining spring
11	GND	Ground

Pin	Signal name	Meaning
12	GND	Ground
13	P12V	Power supply for pressure measurement in the dispensing unit
14	UANDR5	Measuring signal for cassette 5
15	UANDR6	Measuring signal for cassette 6
16	IQLS56VN	Photosensor transmit current Supply voltage
17	ULANDR	Analog voltage for pressure measurement power source
18	LISEL3N	Analog voltage for path photosensor transmit current
19	GND	Ground
20	Vcc	Power supply +5 V
21	LAM135	PSD5 receiver, emitter
22	LKL135	PSE5 receiver, emitter
23	LAM246	PSD6 receiver, emitter
24	LKL246	PSE6 receiver, emitter
25	GND	Ground
26	EEDAT	serial EEPROMs: data line
27	EETAKT	serial EEPROMs: clock line
28	EECSK5	serial EEPROM cassette 5: Select
29	EECSK6	serial EEPROM cassette 6: Select
30	GND	Ground
31	SMDAT0	Stepper motor control signal, Bit 0
32	SMDAT1	Stepper motor control signal, Bit 1
33	SMDAT2	Stepper motor control signal, Bit 2
34	SMDAT3	Stepper motor control signal, Bit 3
35	SMDAT4	Stepper motor control signal, Bit 4
36	SMDAT5	Stepper motor control signal, Bit 5
376	SMDAT6	Stepper motor control signal, Bit 6
38	IOE	I/O-Enable
39	ENSMK5N	Clock signal for SM latch cassette 5
40	ENSMK6N	Clock signal for SM latch cassette 6

Connector for shutter (incl. Z module)

Elements	
DCM7, DCM8	Shutter motor, DC
DPS10/11, DPS12/13	Digital photosensors for shutter position
DCM4	Stepper motor for Z module drive
PS27 / PS28	Cash path monitoring in the Z module

Connector: 15-pin DSUB, pins 90°

Pin	**Signal name**	**Meaning**
1	ZTAKT	Clock for stepper motor of Z module
2	ZRICHTG	Direction for stepper motor of Z module
3	RMSH1N	Indicator for shutter position bit 0
4	GND	Ground
5	SHMOTEN	Shutter motor M7 or M8 ON
6	ZEIN	Stepper motor of Z module ON
7	LSH27	PS27 signal
8	- nc -	- not connected -
9	IQLSSH	Photosensor transmit current
10	P24V	Power supply +24 V
11	RMSH2N	Indicator for shutter position bit 1
12	SHMOTRN	Shutter motor M7 or M8, Direction
13	P12V	Power supply +12 V
14	GNDL	Ground for load current
15	LSH28	PS28 signal

The two indicators RMSH1N and RMSH2N output the shutter position in coded form. Before the cash is output, the shutter is moved completely to the 'OPEN' position.

When the cash has been transported to the output slot, the shutter is moved back to the 'CLOSED' position until the transition from L L to H H has been completed. (L = 0 V - H = +12 V)

RMSH2N	**RMSH1N**	**Meaning**
H	L	Shutter flap is 'CLOSED'
L	L	Shutter flap between 'CLOSED' and cash presentation
H	H	Shutter flap between cash presentation and 'OPEN'
L	H	Shutter flap is 'OPEN'

Connector for thickness measuring station

Elements	
Optical thickness measuring	
DMLED1, DMLED2	Transmit diodes
DMPHT1, DMPHT2	Receive transistors
Mechanical thickness measuring	
	Reflective photosensors 1, 2

Connector: 10-pin DUBOX, pins, 2 rows, 90°

Pin	**Signal name**	**Meaning**
1	DMLED1IN	Transmit current for IR LED of reflective photosensor 1
2	DMLED1OUT	Transmit current for IR LED of reflective photosensor 1
3	DMLED2IN	Transmit current for IR LED of reflective photosensor 2
4	DMLED2OUT	Transmit current for IR LED of reflective photosensor 2
5	P12V	Power supply +12 V
6	DMPHT1	Intensified signal for phototransistor 1 of reflective photosensor 1
7	N12V	Power supply -12 V
8	DMPHT2	Intensified signal for phototransistor 2 of reflective photosensor 2
9	GND	Ground
10	DMCOD	Coding optical / mechanical thickness measurement: GND = optical / open = mechanical

Connection of door switch

Elements	
Solenoid-operated switch	Door switch of safe door
Bridge	Reports that the solenoid-operated switch is connected

Connector: 4-pin DUBOX, 1 row, 90°

Pin	**Signal name**	**Meaning**
1	TUERM	Solenoid-operated switch / Door switch of safe door
2	GND	Ground for solenoid-operated switch
3	TUERB	Jumper that reports wiring of the door switch
4	GND	Ground for bridge

Battery connector

Elements	
Lithium battery	TL5242/W (no. 92675.07.1.39), 3.6V/1.9Ah

Connector: 4-pin Berg pin contact strip, one row, 90°

Pin	**Signal name**	**Meaning**
1	VBATT	Plus pole (battery)
2	- nc -	- not connected -
3	- nc -	- not connected -
4	GND	Minus pole (battery)

RS232C connection

The controlling system unit (PC) is connected via this RS232C interface.

Connector: 9-pin Sub-D, pins 90°

Pin	Signal name	Meaning
1	DCD1	Carrier Detect
2	RXD1	Receive Data (IN)
3	TXD1	Transmit Data (OUT)
4	DTR1	Data Terminal Ready
5	GND	Ground
6	DSR1	Data Set Ready
7	RTS	Request to Send (OUT)
8	CTS	Ready for Sending (IN)
9	RI	Ring Indicator

The 9-pin Sub-D connector is pinned in accordance with the standard. The CTS input (pin 8) is connected at +12 V on a high-resistance basis in order to receive a defined signal when the input is open.

CMD controller

Connectors at the left side of the controller:

X1 mechanichal thickness sensor
Dubox connector, 8-pin
(Reihe = 2466407537, Sohn = 2466410537)

Pin	Name
1	+ 5 V
2	GND
3	Measuring input for the first analog Hall sensor
4	GND
5	+ 5 V
6	GND
7	Measuring input for the second analog Hall sensor
8	GND

X2 shutter
JST pin connector model PHD, 2 x 10-pin, S20B-PHDSS (90°)
(Reihe = A3C40014865, Sohn = A3C40014864)

Pin	Name
1	+ 24 V
2	Last – GND
3	+ 12 V
4	GND
5	Release of energization of SM7 (24 V level) / phase + (open) of M7
6	Direction of SM7 (24 V level) / phase - (closed) of M7
7	Gate input of DPS10
8	Gate input of DPS11
9	Gate input of DPS12 (reserve)
10	Measuring input for phototransistor of PS27 or PS26 (detection of cash removal) (PSR6)

Pin	Name
11	Measuring input for phototransistor of PS28 or PS29 (rear edge control) (PSR7)
12	+ current for transmit diodes from PS27, PS28 or PS26, PS29 (LSISH)
13	Gate input of shutter1
14	GND
15	Gate input of shutter2
16	GND
17	Gate input of shutter3
18	GND
19	Gate input of shutter4
20	GND

Jumper coding

Pin 19	Pin 17	Pin 15	Pin 13	
Shutter4	Shutter3	Shutter2	Shutter1	
-	-	-	B	= Shutter in safe
-	-	-	B	= Shutter in counter section

X3 transport module
JST pin connector model PHD, 2 x 6-pin, S12B-PHDSS (90°)
(Reihe = A3C40015986, Sohn = A3C40015984)

Pin	Name
1	+ 5 V
2	Gate input of HS4 (sensor for clamp end position)
3	GND
4	N.C.
5	Gate input of transport1
6	GND
7	Gate input of transport2
8	GND
9	Gate input of transport3
10	GND
11	Gate input of transport4
12	GND

Jumper coding

Pin 11	Pin 9	Pin 7	Pin 5	
Transport4	Transport3	Transport2	Transport1	
-	-	-	B	= Rearload transport module in safe
-	-	B	-	= Frontload transport module in safe
-	B	-	B	= Rearload transport module in counter section
-	B	B	-	= Frontload transport module in counter section

X4 V.24 interface from PC

Pin	Name
1	+ 5 V
2	Gate input of HS4 (sensor for clamp end position)
3	GND
4	N.C.
5	Gate input of transport1
6	GND
7	Gate input of transport2
8	GND
9	Gate input of transport3
10	GND
11	Gate input of transport4
12	GND

8-pin Western

(Reihe = 5603107937;00 or A3C40016907, Sohn = 5603111937)

Pin	Name
1	N.C.
2	DSR, not connected
3	RXD
4	DTR / RTS
5	TxD
6	GND
7	CTS
8	N.C.

X5 USB interface from PC
USB connector B-type, (Reihe: 0150507337;00)

Pin	Name
1	N.C.
2	USB-Data -
3	USB-Data +
4	GND
5	Shielding
6	Shielding

X6 Door switch and disconnector in safe
JST pin connector model PHD, 2 x 5-pin, S10B-PHDSS (90°)
(Reihe = A3C40016307;00, Sohn = A3C40016306)

Pin	Name
1	N.C.
2	N.C.
3	Polling the safety switch
4	GND
5	Polling the door switch
6	GND
7	Polling the jumper
8	GND
9	Reserve input
10	GND

X7 V.24 interface to AVT2800 (SCOP card)
JST pin connector model PH, 6-pin, B6B-PH-K-S (upright)
(Reihe = 9405007037, Sohn = 9405010037)

Pin	Name
1	N.C. (DSR, not connected)
2	RXD
3	DTR / RTS
4	TxD
5	GND
6	CTS

X8 NEN from special electronics module
JST pin connector model PH, 2-pin, S2B-PH-K-S (90°)
(Reihe = A3C40014712;11, Sohn = A3C40014711)

Pin	Name
1	NEN
2	GND

X9 24-V voltage supply
2-pin Mini-Fit 39-30-1020
(Reihe = A3C40029754, Sohn = A3C40029755)

Pin	Name
1	+ 24 V
2	GND

Connectors at the top side of the controller:

X10 24-V connection to AVT2800 (SCOP card)
2-pin Mini-Fit 39-30-1020
(Reihe = A3C40029754, Sohn = A3C40029755)

Pin	Name
1	+ 24 V
2	GND

X11 motor M1)
6-pin Mini-Fit 39-30-1060
(Reihe = A3C40030083, Sohn = A3C40009552)

Pin	Name
1	Motor +
2	N.C.
3	Clock signal from main motor M1
4	Motor -
5	+5 V
6	GND

X12 additional motor on main drive assembly for single reject (optional)
JST pin connector model PH, 1 x 4-pin, S4B-PH-K-S (90°)
(Reihe = 7206807137, Sohn = 7206810137)

Pin	Name
1	Phase A + of SM1 (pressure of sliding surface to empty the single reject)
2	Phase A - of SM1 (pressure of sliding surface to empty the single reject)
3	Phase B + of SM1 (pressure of sliding surface to empty the single reject)
4	Phase B - of SM1 (pressure of sliding surface to empty the single reject)

X13 clamp motor
ZIF connector, 4-pin, 1.25 mm, Molex, Reihe 5597, type 39-51-3043, Top contact
(Reihe = A3C40029756, Sohn = A3C40029757)

Pin	Name
1	+ of clamp motor M2
2	- of clamp motor M2
3	+ from belt drive on clamp M3
4	- from belt drive on clamp M3

X14 motors and lifting magnets at stacker / left and right sides
JST pin connector model PHD, 2 x 9-pin, S18B-PHDSS (90°)
(Reihe = A3C40032097, Sohn = A3C40032098)

Pin	Name
1	Phase A + from SM9 (stacker wheel)
2	Phase A - from SM9 (stacker wheel)
3	Phase B + from SM9 (stacker wheel)
4	Phase B - from SM9 (stacker wheel)
5	Phase A + from SM2 (left routing disk)
6	Phase A - from SM2 (left routing disk)
7	Phase B + from SM2 (left routing disk)
8	Phase B - from SM2 (left routing disk)
9	Phase A + from SM3 (right routing disk)
10	Phase A - from SM3 (right routing disk)
11	Phase B + from SM3 (right routing disk)
12	Phase B - from SM3 (right routing disk)
13	+ 24 V
14	Lifting magnet MA6 (Retract compartment)
15	+ 24 V
16	Lifting magnet MA2 / 1 (switch control for single reject, optional)
17	+ 24 V
18	Lifting magnet MA2 / 2 (switch control for single reject, optional)

X15 EEPROM at stacker
ZIF connector, 8-pin, 1.00 mm, Molex, Reihe 52043, (90°), Bottom Contact
(Reihe = A3C40030173, Sohn = A3C40030174)

Pin	Name
1	+ 5 V
2	GND
3	Chip-Select to EEPROM
4	Clock to EEPROM
5	Data output to EEPROM
6	Data input from EEPROM
7	N.C.
8	N.C.

X16 Hall sensors at stacker
JST pin connector model PHD, 2 x 6-pin, S12B-PHDSS (90°)
(Reihe = A3C40015986, Sohn = A3C40015984)

Pin	Name
1	Vcc
2	Vcc
3	Gate input of HS1 (sensor for clamp basic position)
4	Gate input of HS2 (sensor for reject/retract initial position)
5	GND
6	GND
7	Vcc
8	Vcc
9	Gate input of HS3 (sensor for reject/retract return position)
10	Gate input of DPS3 (reserve, used several times!!!)
11	GND
12	GND

X17 Hybrid photosensors and photosensors at single reject
JST pin connector model PHD, 2 x 8-pin, S16B-PHDSS (90°)
(Reihe = 0152307537;00, Sohn = 0152310537)

Pin	Name
1	Vcc
2	Vcc
3	Gate input of DPS14 (sensor for switch position of single reject)
4	Gate input of DPS15 (sensor for switch position of single reject)
5	GND
6	GND
7	Vcc
8	Vcc
9	Gate input of DPS7 (sensor for basic position of the sliding surface in single reject)
10	Gate input of DPS3 (reserve, used several times!!!)
11	GND
12	GND
13	Power supply for photo transistor from PS2 (check for empty compartment during single reject) (LSVCC)
14	assuring input for phototransistor of PS2 (checking for empty compartment with single reject) (LSR5)
15	+ current for transmit diodes from PS2 (LSIPLUS)
16	- current for transmit diodes from PS2 (LSIS2)

X18 Hybrid photosensors and photosensors at stacker / left side
JST pin connector model PHD, 2 x 11-pin, S22B-PHDSS (90°)
(Reihe = A3C40032102, Sohn = A3C40032103)

Phototransistor of PS18 installed.

Pin	Name
1	Vcc
2	Vcc
3	Gate input of DPS5 (polling the position of the left routing disk)
4	Gate input of DPS8 (polling the position of the left routing disk)
5	GND
6	GND
7	Vcc
8	Vcc
9	Gate input of DPS2 (sensor for stacker wheel position)
10	Gate input of DPS4 (sensor for retract compartment)
11	GND
12	GND
13	Vcc
14	Vcc
15	Gate input of DPS1 (reserve)
16	Gate input of DPS3 (reserve, used several times!!!)
17	GND
18	GND
19	Power supply for photo transistor from PS1 (stacker wheel intake) (LSVCC)
20	Measuring input for photo transistor from PS1 (stacker wheel intake) (LSR3)
21	+ current for transmit diodes from PS1 + PS18 (LSIPLUS)
22	- current for transmit diodes from PS1 + PS18 (LSIS1)

Connectors at the bottom of the controller:

X30 dispensing units
pin contact strips, 2 x 20-pin (even) (Reihe = 2383807837)

Pin	Name
1	GND
2	GND
3	GND
4	GND
5	GND
6	+ 5 V
7	+ 5 V
8	+ 5 V
9	+ 5 V switched
10	+ 5 V switched
11	+ 5 V switched
12	Last – GND
13	Last – GND
14	Last – GND
15	Last – GND
16	Last – GND
17	Last – GND
18	+ 24 V switched
19	+ 24 V switched
20	+ 24 V switched
21	+ 24 V switched
22	+ 24 V switched
23	+ 24 V switched
24	Dispensing gear of dispensing unit 1
25	Retaining magnet of dispensing unit 1
26	Dispensing gear of dispensing unit 2
27	Retaining magnet of dispensing unit 2
28	Dispensing gear of dispensing unit 3
29	Retaining magnet of dispensing unit 3

Pin	Name
30	Dispensing gear of dispensing unit 4
31	Retaining magnet of dispensing unit 4
32	Dispensing gear of dispensing unit 5
33	Retaining magnet of dispensing unit 5
34	Dispensing gear of dispensing unit 6
35	Retaining magnet of dispensing unit 6
36	Dispensing gear of dispensing unit 7
37	Retaining magnet of dispensing unit 7
38	Dispensing gear of dispensing unit 8
39	Retaining magnet of dispensing unit 8
40	Last - GND

X31 dispensing units
pin contact strips, 2 x 20-pin (even) (Reihe = 2383807837)

Pin	Name
1	GND
2	EEPROM-clock
3	EEPROM-data
4	D0
5	D1
6	D2
7	D3
8	D4
9	D5
10	D6
11	D7
12	CS-ICN
13	CS-ReserveN
14	CS-Dispensing unit1
15	CS-Dispensing unit2
16	CS-Dispensing unit3
17	CS-Dispensing unit4
18	CS-Dispensing unit5
19	CS-Dispensing unit6
20	CS-Dispensing unit7
21	CS-Dispensing unit8
22	WRN
23	RDN
24	ResetN
25	GND
26	Free
27	Power source for LEDs (LSIPLUS)
28	Current sink dispensing unit 1 (LSIV1)
29	Current sink dispensing unit 2 (LSIV2)

Pin	Name
30	Current sink dispensing unit 3 (LSIV3)
31	Current sink dispensing unit 4 (LSIV4)
32	Current sink dispensing unit 5 (LSIV5)
33	Current sink dispensing unit 6 (LSIV6)
34	Current sink dispensing unit 7 (LSIV7)
35	Current sink dispensing unit 8 (LSIV8)
36	Power supply photo transistors (LSVCC)
37	Polling the first phototransistor for pressure sensor (LSANDR)
38	Polling the second phototransistor for empty sensor (LSR1)
39	Polling the third phototransistor for pressure sensor (LSR2)
40	GND

X32 Hybrid photosensors and photosensors at stacker / right side
JST pin connector model PHD, 2 x 7-pin, B14B-PHDSS (upright)
(Reihe = A3C40032574, Sohn = A3C40032575)

Pin	Name
1	Vcc
2	Vcc
3	Gate input of DPS6 (polling the position of the right routing disk)
4	Gate input of DPS9 (polling the position of the right routing disk)
5	GND
6	GND
7	Vcc
8	Vcc
9	Gate input of S1 (switch reports 'reject/retract cassette inserted')
10	Gate input of DPS3 (reserve, used several times!!!)
11	GND
12	GND
13	Power supply for photo transistors from PS18 (Intake monitoring in front of the reject cassette) (LSVCC)
14	Measuring input for phototransistor of PS18 (Intake monitoring in front of the reject cassette) (LSR4)

X33 position switch and extensions
JST pin connector model PHD, 2 x 17-pin, B34B-PHDSS (upright)
(Reihe = A3C40036263, Sohn = A3C40036264)

Pin	Name
1	+ 5 V
2	GND
3	+ 24 V
4	Last - GND
5	Chip-Select to reserve device at SPI2
6	Clock to reserve device at SPI2
7	Data output to reserve device at SPI2
8	Data input from reserve device at SPI2
9	Polling the position switch
10	GND
11	Reserve output
12	GND
13	Segment A of 7-segment display up / left
14	Segment B of 7-segment display up / left
15	Segment C of 7-segment display up / left
16	Segment D of 7-segment display up / left
17	Segment E of 7-segment display up / left
18	Segment F of 7-segment display up / left
19	Segment G of 7-segment display up / left
20	Segment DP of 7-segment display up / left
21	Special output for 7-segment display up / left
22	Segment A of 7-segment display bottom / right
23	Segment B of 7-segment display bottom / right
24	Segment C of 7-segment display bottom / right
25	Segment D of 7-segment display bottom / right
26	Segment E of 7-segment display bottom / right
27	Segment F of 7-segment display bottom / right
28	Segment G of 7-segment display bottom / right
29	Segment DP of 7-segment display bottom / right

Pin	Name
30	Special output for 7-segment display bottom / right
31	Free
32	Free
33	Free
34	Free

Connectors at the right side of the controller:

X40 jumpers
Berg pin connector, 2 x 10-pin (Reihe 5673507037;10)

Pin	Name
1	'Door' (pay attention to safe door), to be polled by firmware
2	GND
3	'SCOP' connected, to be polled by firmware
4	GND
5	'Jump A' (reserve input A), to be polled by firmware
6	GND
7	'Jump B' (reserve input B), to be polled by firmware
8	GND
9	'Jump C' (reserve input C), to be polled by firmware
10	GND
11	'Jump D' (reserve input D), to be polled by firmware
12	GND
13	'Clear CMOS' RAM, to be polled by firmware
14	GND
15	'NEN', to be polled by firmware also
16	GND
17	'Battery' jumper
18	GND
19	'Jump PLD' jumper (jumper to control a PLD function)
20	GND

There are also the following elements:

Battery, indicator, beeper, key

Connectors in the center of the controller:

X50 JTAG-PLD programming connector

X51 Kontron test connector

X52 Turbodebugger connector

4-channel distributor board

First connection to CMD controller

Pin	Name
1	GND
2	GND
3	GND
4	GND
5	GND
6	+ 5 V
7	+ 5 V
8	+ 5 V
9	+ 5 V switched
10	+ 5 V switched
11	+ 5 V switched
12	Last - GND
13	Last - GND
14	Last - GND
15	Last - GND
16	Last - GND
17	Last - GND
18	+ 24 V switched
19	+ 24 V switched
20	+ 24 V switched
21	+ 24 V switched
22	+ 24 V switched
23	+ 24 V switched
24	Dispensing gear of dispensing unit 1
25	Retaining magnet of dispensing unit 1
26	Dispensing gear of dispensing unit 2
27	Retaining magnet of dispensing unit 2
28	Dispensing gear of dispensing unit 3
29	Retaining magnet of dispensing unit 3

Pin	Name
30	Dispensing gear of dispensing unit 4
31	Retaining magnet of dispensing unit 4
32	Dispensing gear of dispensing unit 5
33	Retaining magnet of dispensing unit 5
34	Dispensing gear of dispensing unit 6
35	Retaining magnet of dispensing unit 6
36	Dispensing gear of dispensing unit 7
37	Retaining magnet of dispensing unit 7
38	Dispensing gear of dispensing unit 8
39	Retaining magnet of dispensing unit 8
40	Last - GND

Second connection to CMD controller

Pin	Name
1	GND
2	EEPROM-clock
3	EEPROM-data
4	D0
5	D1
6	D2
7	D3
8	D4
9	D5
10	D6
11	D7
12	CS-ICN
13	CS-ReserveN
14	CS-Dispensing unit1
15	CS-Dispensing unit2
16	CS-Dispensing unit3

Pin	Name
17	CS-Dispensing unit4
18	CS-Dispensing unit5
19	CS-Dispensing unit6
20	CS-Dispensing unit7
21	CS-Dispensing unit8
22	WRN
23	RDN
24	ResetN
25	GND
26	Free
27	Power source for LEDs (LSIPLUS)
28	Current sink dispensing unit 1 (LSIV1)
29	Current sink dispensing unit 2 (LSIV2)
30	Current sink dispensing unit 3 (LSIV3)
31	Current sink dispensing unit 4 (LSIV4)
32	Current sink dispensing unit 5 (LSIV5)
33	Current sink dispensing unit 6 (LSIV6)
34	Current sink dispensing unit 7 (LSIV7)
35	Current sink dispensing unit 8 (LSIV8)
36	Power supply photo transistors (LSVCC)
37	Polling the first phototransistor for pressure sensor (LSANDR)
38	Polling the second phototransistor for empty sensor (LSR1)
39	Polling the third phototransistor for pressure sensor (LSR2)
40	GND

1 or 4 cassette connectors (ISEP)

Pin	Name
1	Data from and to EEPROM
2	Clock to EEPROM
3	Chip-Select to EEPROM
4	GND for Logic
5	+ 5 V switched
6	+ 24 V
7	Stepper motor
8	Stepper motor
9	Stepper motor
10	Stepper motor
11	Last - GND

Connector for the 1-channel distributor board

Pin	Name
1	Power source for the transmit diodes (LSIPLUS)
2	Dispensing unit x current sink (LSIVx), activates the three transmit diodes of the only dispensing unit
3	Power supply for the pressure photo transistor (LSVCC)
4	Input from pressure photo transistor (LSANDR) (PS at the side)
5	Power supply for the 'cassette empty' photo transistor (LSVCC)
6	Input from 'cassette empty' photo transistor (LSR1) (PS at top)
7	Power supply for the dispensing photo transistor (LSVCC)
8	Input from dispensing photo transistor (LSR2) (PS at bottom)
9	+ 24 V for dispensing gear
10	Output to dispensing gear of dispensing unit x
11	+ 24 V for retaining magnet
12	Output to retaining magnet of dispensing unit x

Connector for the two Double dispensing units at the 4-channel distributor board

Pin	Name
1	Power source for the transmit diodes (LSIPLUS)
2	Dispensing unit x current sink (LSIVx), activates the three transmit diodes of the only dispensing unit
3	Power supply for the pressure photo transistor (LSVCC)
4	Input from pressure photo transistor (LSANDR) (PS at the side)
5	Power supply for the 'cassette empty' photo transistor (LSVCC)
6	Input from 'cassette empty' photo transistor (LSR1) (PS at top)
7	Power supply for the dispensing photo transistor (LSVCC)
8	Input from dispensing photo transistor (LSR2) (PS at bottom)
9	Power source for the transmit diodes (LSIPLUS)
10	Dispensing unit x+1 current sink (LSIVx+1), activates the three transmit diodes of the only dispensing unit x+1
11	Power supply for the pressure photo transistor (LSVCC)
12	Input from pressure photo transistor (LSANDR) (PS at the side)
13	Power supply for the 'cassette empty' photo transistor (LSVCC)
14	Input from 'cassette empty' photo transistor (LSR1) (PS at top)
15	Power supply for the dispensing photo transistor (LSVCC)
16	Input from dispensing photo transistor (LSR2) (PS at bottom)
17	+ 24 V for dispensing gear
18	Output to dispensing gear of dispensing unit x
19	+ 24 V for retaining magnet
20	Output to retaining magnet of dispensing unit x
21	+ 24 V for dispensing gear
22	Output to dispensing gear of dispensing unit x+1
23	+ 24 V for retaining magnet
24	Output to retaining magnet of dispensing unit x+1

Spare Parts

Overview of individual parts

Output transports	
Part no.	**Name**
1750057875	AGT CMD-V4 horizontal FL 101 mm (for ProCash 1500xe FL)
1750059284	AGT CMD-V4 horizontal RL 124 mm (for ProCash 1500xe RL)
1750045360	AGT CMD-V4 vertical FL (for ProCash 2000xe FL)
1750045348	AGT CMD-V4 vertical RL (for ProCash 2000xe RL)
1750059116	AGT CMD-V4 horizontal RL 232 mm (for ProCash 2050xe RL)
1750045360	AGT CMD-V4 vertical FL (for ProCash 2100xe FL)
1750045348	AGT CMD-V4 vertical RL (for ProCash 2100xe RL)
1750059116	AGT CMD-V4 horizontal RL 232 mm (for ProCash 2150xe RL)
1750059116	AGT CMD-V4 horizontal RL 232 mm (for ProCash 2250xe RL)
1750059283	AGT CMD-V4 horizontal FL 241 mm (for ProCash 2350xe FL)
1750059116	AGT CMD-V4 horizontal RL 232 mm (for ProCash 2350xe RL)
1750068776	AGT CMD-V4 horizontal FL 125 mm (for ProCash 5000 mini)
1750068690	AGT CMD-V4 SCO

Stacker	
Part no.	**Name**
1750058042	CMD stacker complete with single reject switch
1750055782	CMD stacker without single reject switch
1750053977	CMD-V4 clamp

Shutter	
Part no.	**Name**
1750045330	Shutter CMD-V4 Rearload assembled
1750054768	Shutter CMD-V4 vertical Frontload
1750053690	Shutter CMD-V4 horizontal Rearload
1750056960	Shutter CMD-V4 horizontal Frontload

Controller and distributor prints	
Part no.	**Name**
1750055781	CMD controller assembled (incl. cover)
1750074210	CMD controller with USB assembled with cover
1750044878	4-channel distributor print, assembled (incl. cover)
1750052425	1-channel distributor print, assembled (incl. cover)
1750019771	Chipcard controller SCOP
1750068065	Extension board in conjunction with the ProCash 5000 (mini)

Housings	
Part no.	**Name**
1750053055	CMD-V4 4-cassette housing assembled
1750054048	1-cassette housing complete with latching mechanism
1750054366	1-cassette housing complete without latching mechanism
1750064370	CMD outsert, 4-cassette housing, preassembled
1750066065	CMD outsert, 1-cassette housing, without latching mechanism, preassembled
1750066067	CMD outsert, 1-cassette housing, preassembled
1750057257	CMD cover 4-cassette housing
1750057281	CMD cover 1-cassette housing
1750055308	CMD latch

Dispensing units	
Part no.	**Name**
1750051760	Double dispensing unit CMD-V4 (without thickness measuring station)
1750051761	Double dispensing unit CMD-V4 (with thickness measuring station)
1750051758	Single dispensing unit CMD-V4 (without thickness measuring station)
1750051759	Single dispensing unit CMD-V4 (with thickness measuring station)
1750035762	CMD-V4 dispensing shaft, assembled

Reject / retract cassette	
Part no.	**Name**
1750041920	CMD reject / retract cassette
1750056651	CMD reject / retract cassette lead-sealed
1750056652	CMD reject cassette lead-sealed
1750056653	CMD reject cassette
1750061714	CMD reject / retract cassette lockable
1750061877	CMD reject cassette lockable
1750063255	CMD reject cassette gray
1750063256	CMD reject cassette lockable gray
1750063257	CMD reject cassette lead-sealed gray

Cash-out cassettes	
Part no.	**Name**
1750053501	Cash-out cassette CMD-V4
1750053502	CMD-V4 cash-out cassette, lockable
1750053503	Cash-out cassette CMD-V4 lead-sealed
1750053504	Cash-out cassette CMD-V4 FSM
1750053505	CMD-V4 FSM cash-out cassette, lockable
1750053506	Cash-out cassette CMD-V4 FSM lead-sealed
1750053511	Cash-out cassette BBA-UT CMD-V4
1750053512	Cash-out cassette BBA-UT CMD-V4 lockable
1750053513	Cash-out cassette BBA-UT CMD-V4 lead-sealed
1750053540	Cash-out cassette CMD-V4 no cash
1750053550	Cash-out cassette CMD-V4 ink
1750081760	Cash-out cassette CMD-V4 ink 2
1750042970	CMD case assembled
1750043537	CMD sealing cover assembled
1750058210	CMD cassette cover blue pr.
1750058211	CMD cassette cover ink pr.
1750042973	CMD cassette cover assembled
1750038783	CMD cassette handle
1750045537	CMD shutter, assembled
1750081830	CMD cassette cover ink 2 preassembled
5482000111	Lock assd.

Miscellaneous	
Part no.	**Name**
1750050322	CMD guard strip, left
1750050323	CMD guard strip, right

i With the introduction of the CMD-V4 FRU numbers have been introduced.

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Notes

Published by
Wincor Nixdorf International GmbH
33094 Paderborn
Germany

Printed in Germany

Order No.: **01750060162 B**